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1AC—Warming

Observation 1 is Warming:

Despite All the Signs in Their Favor, Electric Cars are Failing Now

New York Times, "The Electric Car, Unplugged," March 24th, 2012 (<http://www.nytimes.com/2012/03/25/sunday-review/the-electric-car-unplugged.html?pagewanted=all>)

THE future would appear bright for the electric car. Gasoline prices are high. The government is spending billions on battery technology. Auto companies are preparing to roll out a dozen new electrified models. Concern is growing about the climate impacts of burning oil. And tough new fuel economy standards are looming.

Yet the state of the electric car is dismal, the victim of hyped expectations, technological flops, high costs and a hostile political climate. General Motors has temporarily suspended production of the plug-in electric Chevy Volt because of low sales. Nissan's all-electric Leaf is struggling in the market. A number of start-up electric vehicle and battery companies have folded. And the federal government has slowed its multibillion-dollar program of support for advanced technology vehicles in the face of market setbacks and heavy political criticism.

The \$41,000 Volt, in particular, has become a target of conservatives. Glenn Beck called the Volt "[crappy](#)." Rush Limbaugh accused General Motors of "[trying to kill its customers](#)" by selling an unsafe car. Former House Speaker Newt Gingrich said while campaigning for president in Georgia last month that the Volt was too small to handle a [gun rack](#) (a claim proved wrong repeatedly on [YouTube](#)).

Daniel F. Akerson, the chairman of General Motors, [defended the Volt](#) before Congress earlier this year after revelations that the battery pack in one Volt caught fire three weeks after a federal crash test. Federal authorities eventually declared the car no more flammable than regular gasoline-fueled vehicles.

"Unfortunately, there's one thing we did not engineer," Mr. Akerson said. "Although we loaded the Volt with state-of-the-art safety features, we did not engineer the Volt to be a political punching bag. And that, sadly, is what it's become."

Is this the beginning of the end of the latest experiment in the electric car, whose checkered history goes back to the dawn of the automobile age? Can the electric car survive only with heavy government subsidies and big consumer rebates? Are

the [Teslas](#) and [Fiskers](#) and [ActiveEs](#) and Volts and Leafs destined to be the playthings of only rich technophiles with a couple of spare gas-powered cars at home?

1AC—Warming

Obama is Dropping the Electric Car—The Fleet Focus is Shifting to Ethanol Vehicles to Nominally Maintain the Target Without Actually Solving Emissions

Bloomberg News, "Obama's Green-Car Plan Runs Into Alternative-Fuel Limits," February 24th, 2012

(<http://www.bloomberg.com/news/2012-02-24/obama-s-green-car-plan-runs-into-alternative-fuel-limits-cars.html>)

President Barack Obama's administration is buying fewer hybrid and electric cars and more vehicles that can consume both ethanol and gasoline to meet 2015 environmental goals, favoring older technology over new.

Obama gave speeches across the U.S. last year touting his twin goals of buying only alternative-fuel vehicles for the U.S. fleet by 2015 and getting 1 million electric vehicles on the country's roads by that year.

That's looking more difficult as the federal government learns the same lesson that U.S. car consumers have already figured out: it is tough being green. Rather than leading the way, the government has discovered that the high cost of hybrids and electric cars and their lack of availability often mean it makes more sense to buy cars with fuel-efficient conventional engines. "You can say you're engaged in this behavior -- saving the world -- but it's not a true picture of what you're doing if the vehicles aren't using alternative fuels," said [Rebecca Lindland](#), an industry analyst at IHS Automotive in Norwalk, [Connecticut](#).

U.S. General Services Administration purchases of hybrid and electric models fell 59 percent in fiscal 2011 to about 2,645 as the federal fleet added 32,000 cars and trucks that can burn a fuel that's 85 percent ethanol, or E85 vehicles, when it's available.

Steeper Decline

The decrease in hybrid- and electric-vehicle buying compares with a 14 percent decline in overall GSA car and truck buying last year.

The Obama administration includes vehicles that can use either E85 ethanol-based fuel or gasoline in its definition of alternative-fuel vehicles.

"Agencies are well underway implementing those steps and fully on track to meet the president's order," said Taryn Tuss, a spokeswoman for the White House Council on Environmental Quality. The number of hybrid vehicles in the federal fleet almost doubled from 2009 to 2010, she said.

The problem is that buying and driving ethanol fueled cars solves very little. The GSA, which owns about a third of the federal fleet, said last year that 88 percent of its alternative-fuel vehicles are capable of using ethanol. Still, ethanol fuel pumps are not very common and car owners, including the federal government, often have to use gasoline instead, said Lindland.

1AC—Warming

Global Climate Change is a Scientific Certainty—The Emission of Greenhouse Gasses By Humans is Fundamentally Responsible and Action Now is Crucial to Eliminate the Threat

Science Magazine, Letter Signed by 255 Members of the National Academy of Science, "CLIMATE CHANGE AND THE INTEGRITY OF SCIENCE," May 7th, 2010 (http://www.pacinst.org/climate/climate_statement.pdf)

We are deeply disturbed by the recent escalation of political assaults on scientists in general and on climate scientists in particular. All citizens should understand some basic scientific facts. **There is always some uncertainty associated with scientific conclusions: science never absolutely proves anything. When someone says that society should wait until scientists are absolutely certain before taking any action, it is the same as saying society should never take action. For a problem as potentially catastrophic as climate change, taking no action poses a dangerous risk for our planet.**

Scientific conclusions derive from an understanding of basic laws supported by laboratory experiments, observations of nature, and mathematical and computer modeling. Like all human beings, scientists make mistakes, but the scientific process is designed to find and correct them. This process is inherently adversarial— scientists build reputations and gain recognition not only for supporting conventional wisdom, but even more so for demonstrating that the scientific consensus is wrong and that there is a better explanation. That's what Galileo, Pasteur, Darwin, and Einstein did. But when some conclusions have been thoroughly and deeply tested, questioned, and examined, they gain the status of "well-established theories" and are often spoken of as "facts."

For instance, there is compelling scientific evidence that our planet is about 4.5bn years old (the theory of the origin of Earth), that our universe was born from a single event about 14bn years ago (the Big Bang theory), and that today's organisms evolved from ones living in the past (the theory of evolution). Even as these are overwhelmingly accepted by the scientific community, fame still awaits anyone who could show these theories to be wrong. **Climate change now falls into this category: there is compelling, comprehensive, and consistent objective evidence that humans are changing the climate in ways that threaten our societies and the ecosystems on which we depend.**

Many recent assaults on climate science and, more disturbingly, on climate scientists by climate change deniers, are typically driven by special interests or dogma, not by an honest effort to provide an alternative theory that credibly satisfies the evidence. The Intergovernmental Panel on Climate Change (IPCC) and other scientific assessments of climate change, which involve thousands of scientists producing massive and comprehensive reports, have, quite expectedly and normally, made some mistakes. When errors are pointed out, they are corrected.

But there is nothing remotely identified in the recent events that changes the fundamental conclusions about climate change:

(i) The planet is warming due to increased concentrations of heat-trapping gases in our atmosphere. A snowy winter in Washington does not alter this fact.

(ii) Most of the increase in the concentration of these gases over the last century is due to human activities, especially the burning of fossil fuels and deforestation.

(iii) Natural causes always play a role in changing Earth's climate, but are now being overwhelmed by human-induced changes.

(iv) Warming the planet will cause many other climatic patterns to change at speeds unprecedented in modern times, including increasing rates of sea-level rise and alterations in the hydrologic cycle. Rising concentrations of carbon dioxide are making the oceans more acidic.

(v) The combination of these complex climate changes threatens coastal communities and cities, our food and water supplies, marine and freshwater ecosystems, forests, high mountain environments, and far more.

Much more can be, and has been, said by the world's scientific societies, national academies, and individuals, but these conclusions should be enough to indicate why scientists are concerned about what future generations will face from business- as-usual practices. **We urge our policymakers and the public to move forward immediately to address the causes of climate change, including the unrestrained burning of fossil fuels.**

We also call for an end to McCarthy- like threats of criminal prosecution against our colleagues based on innuendo and guilt by association, the harassment of scientists by politicians seeking distractions to avoid taking action, and the outright lies being spread about them. **Society has two choices: we can ignore the science and hide our heads in the sand and hope we are lucky, or we can act in the public interest to reduce the threat of global climate change quickly and substantively. The good news is that smart and effective actions are possible. But delay must not be an option.**

1AC—Warming**Even Small Amounts of Warming Can Trigger Feedbacks, Rapidly Accelerating the Speed and Significance of Climate Change**

MICHAEL MILSTEIN, The Oregonian, "Natural 'feedbacks': Scientists test 'the gorilla at the door,'" The Sunday Oregonian (Portland, Oregon), September 9, 2007, p. 1exis

THULE, Greenland --The big wild-cards as the climate changes are what scientists call "feedbacks" --natural mechanisms that, as the climate warms, make it warm ever faster. One example is the barren tundra that covers vast stretches of the Arctic. Rising temperatures melt the frozen ground, stirring microbes that convert underground carbon into added greenhouse gases, which in turn heat up the atmosphere even faster. It's "the gorilla at the door, because just the smallest change in temperature could lead to oxidation of these massive stores of carbon," said Jeffrey Welker, a professor of biology at the University of Alaska in Anchorage.

On Greenland's northwest fringe, down the road from an air base that's the northernmost U.S. defense installation, Welker's science team is testing that point. The scientists strung yellow extension cords across the spongy ground to power space heaters that hang a few feet above the tundra.

The heaters warm the tundra a degree or two, letting the researchers measure how it will behave as global warming nudges temperatures up.

The Alaska scientists are partnered with others from the University of Washington to follow the behavior of a windswept drainage of tundra and ponds, over the hill from a big radar installation.

The reaction to rising temperatures is an especially important question here, because tundra in such high Arctic regions --north of 70 degrees latitude --has long been considered too cold and too poor in carbon to be a big player, compared with lower latitude tundra such as Alaska's.

But as in many other cases involving the effects of global warming, the natural world is reacting in surprising ways.

The high Arctic tundra now appears to hold much more carbon than scientists thought, and can churn it out rapidly. That happens even faster when extra precipitation dampens the ground, which is also likely because global warming helps the air hold more water -- fueling storms.

"These carbon pools are much greater than we thought, and can be almost spontaneously released," Welker said. "Our longstanding dogma, our longstanding perspective is changing now."

1AC—Warming

Failure to Check Climate Change Will Unleash the Sixth Circle of Hell—Eliminating All Life On Earth and Outweighing the Release of Every Nuclear Weapon on the Planet

Richard Girling, "What will climate change do to our planet?" Times Online (London), March 11, 2007

(<http://www.timesonline.co.uk/tol/news/uk/science/article1480669.ece>)

Although warming on this scale lies within the IPCC's officially endorsed range of 21st-century possibilities, climate models have little to say about what Lynas, echoing Dante, describes as "the Sixth Circle of Hell". To see the most recent climatic lookalike, we have to turn the geological clock back between 144m and 65m years, to the Cretaceous, which ended with the extinction of the dinosaurs. There was an even closer fit at the end of the Permian, 251m years ago, when global temperatures rose by - yes - six degrees, and 95% of species were wiped out.

"That episode," says Lynas, "was the worst ever endured by life on Earth, the closest the planet has come to ending up a dead and desolate rock in space." On land, the only winners were fungi that flourished on dying trees and shrubs. At sea there were only losers. "Warm water is a killer. Less oxygen can dissolve, so conditions become stagnant and anoxic. Oxygen-breathing water-dwellers - all the higher forms of life from plankton to sharks - face suffocation. Warm water also expands, and sea levels rose by 20 metres." The resulting "super-hurricanes" hitting the coasts would have "triggered flash floods that no living thing could have survived".

There are aspects of the so-called "end-Permian extinction" that are unlikely to recur - most importantly, the vast volcanic eruption in Siberia that spread magma hundreds of metres thick over an area bigger than western Europe and shot billions of tonnes of CO₂ into the atmosphere. That is small comfort, however, for beneath the oceans, another monster stirred - the same that would bring a devastating end to the Palaeocene nearly 200m years later, and that still lies in wait today. Methane hydrate.

Lynas describes what happens when warming water releases pent-up gas from the sea bed. "First, a small disturbance drives a gas-saturated parcel of water upwards. As it rises, bubbles begin to appear, as dissolved gas fizzes out with reducing pressure - just as a bottle of lemonade overflows if the top is taken off too quickly. These bubbles make the parcel of water still more buoyant, accelerating its rise through the water. As it surges upwards, reaching explosive force, it drags surrounding water ?up with it. At the surface, water is shot hundreds of metres into the air as the released gas blasts into the atmosphere. Shockwaves propagate outwards in all directions, triggering more eruptions nearby."

The eruption is more than just another positive feedback in the quickening process of global warming. Unlike CO₂, methane is flammable. "Even in air-methane concentrations as low as 5%," says Lynas, "the mixture could ignite from lightning or some other spark and send fireballs tearing across the sky." The effect would be much like that of the fuel-air explosives used by the US and Russian armies - so-called "vacuum bombs" that ignite fuel droplets above a target. According to the CIA, "Those near the ignition point are obliterated. Those at the fringes are likely to suffer many internal injuries, including burst eardrums, severe concussion, ruptured lungs and internal organs, and possibly blindness." Such tactical weapons, however, are squibs when set against methane-air clouds from oceanic eruptions. Scientists calculate that they could "destroy terrestrial life almost entirely" (251m years ago, only one large land animal, the pig-like lystrosaurus, survived). It has been estimated that a large eruption in future could release energy equivalent to 108 megatonnes of TNT - 100,000 times more than the world's entire stockpile of nuclear weapons. Not even Lynas, for all his scientific propriety, can avoid the Hollywood ending. "It is not too difficult to imagine the ultimate nightmare, with oceanic methane eruptions near large population centres wiping out billions of people - perhaps in days. Imagine a 'fuel-air explosive' fireball racing towards a city - London, say, or Tokyo - the blast wave spreading out from the explosive centre with the speed and force of an atomic bomb. Buildings are flattened, people are incinerated where they stand, or left blind and deaf by the force of the explosion. Mix Hiroshima with post-Katrina New Orleans to get some idea of what such a catastrophe might look like: burnt survivors battling over food, wandering far and wide from empty cities."

Then would come hydrogen sulphide from the stagnant oceans. "It would be a silent killer: imagine the scene at Bhopal following the Union Carbide gas release in 1984, replayed first at coastal settlements, then continental interiors across the world. At the same time, as the ozone layer came under assault, we would feel the sun's rays burning into our skin, and the first cell mutations would be triggering outbreaks of cancer among anyone who survived. Dante's hell was a place of judgment, where humanity was for ever punished for its sins. With all the remaining forests burning, and the corpses of people, livestock and wildlife piling up in every continent, the six-degree world would be a harsh penalty indeed for the mundane crime of burning fossil energy."

1AC—Plan

Plan: The United States Federal Government Should Substantially Increase its Investment in a Network of Electric Vehicle Charging Stations and Should Require the Federal Fleet to Purchase Plug-in Electric Vehicles.

1AC—Solvency

Observation 2 is Solvency:**Federal Support for Electric Cars Demonstration Sends a Broad Signal to Spark Interest and Support for Vehicles Nationwide**

School of Public and Environmental Affairs at Indiana University, "Plug-in Electric Vehicles: A Practical Plan for Progress," February 2011 (http://www.indiana.edu/~spea/pubs/TEP_combined.pdf)

National Demonstration of PEVs. **A federally supported, national PEV demonstration program should be implemented to help overcome the information barriers faced by the PEV industry today. A de facto demonstration is already underway as private and governmental efforts prepare target communities for PEVs. Yet these efforts have not been combined and coordinated in a focused national program aimed at "learning by doing." In order to resolve uncertainties about PEVs,** it is crucial that the demonstrations gather data from consumers, dealers, manufacturers, utilities, retailers, and municipalities. **Without key data, the opportunity** to learn about the real-world experience with PEVs—successes, burdens, and mistakes—**will be foregone, and unnecessary public uncertainty, confusion, and debate will continue.**

In the design of a cost-effective national demonstration program, the following program characteristics should be considered:

- A focus on a limited number of designated communities (five to 20, depending on community size) with a range of climates, demographic and housing characteristics, public transit systems, and electric utility and regulatory systems.
 - **A strong partnership between national laboratories, universities, municipalities, and private actors is needed to collect high-quality data. The demonstration communities, and especially the data-gathering exercises within them, must be large enough to support statistically significant sample sizes,** and the original data and findings must be shared widely with researchers and practitioners.
 - In order for a demonstration community to provide useful data, it should have as many of the following characteristics as possible:
 - o streamlined permitting procedures to facilitate recharging;
 - o time-of-use data gathering and electricity pricing capability;
 - o a priority placed on residential recharging infrastructure coupled with some workplace and community recharging;
 - o guidance materials available regarding niche fleet markets where PEVs may be particularly promising because routes are short and recharging can be performed at a central location (e.g., urban pick-up and delivery vehicles);
 - o data gathering activity on vehicle purchasing and leasing, driving patterns, servicing and recharging behaviors, and the evolution of public perceptions and attitudes; and
 - o action plans and evaluation activities that coordinate the vital roles of motorists, car dealers, automakers and suppliers, utilities, regulators, fleet buyers, and universities.
- Such a demonstration program should be monitored by independent analysts to ensure that community demonstrations do not proliferate to the point that they represent a bias toward PEVs.

1AC—Solvency

Electric Cars are Inevitable, But Can Only Come In Time if We Have Federal Support at All Levels—Only Federal Leadership Will Create the Necessary Priority

Nathaniel P. Ford Sr., Executive Director and CEO, San Francisco Municipal Transportation Agency, “EV Future Will Take Partnership,” National Journal, June 20th, 2010 (<http://transportation.nationaljournal.com/2010/06/what-should-transportation-dep.php>)

Electric vehicles require a total partnership at all levels of government and industry in ways we have never seen before. Just like the computer and cell phone changed the way we communicate, the integration of these stand alone devices with the internet has allowed us to explore and experience things that we only dreamed of.

Unlike the personal computer and the cell phone, **the electric vehicle will not be successful without it being networked from the get go.** This means that smart electrical metering needs to be in place at the same time as the vehicle fleet begins the transition toward electrification. **The networking of EVs could optimize recharging and road use to minimize impacts on the energy loads, communicate with parking and demand management programs to minimize congestion and provide the instant connectivity to signals and each other that would eventually eliminate the need to physically hands-on-wheel drive the vehicle. This change would be fundamental**—imagine being able to use that time for more productive things like working, sleeping, sightseeing, eating, socializing or anything else.

The near future of smart EVs linked to the other sustainable mobility modes via your smart phone would ensure that smart mobility decisions are being made each day and every day. The SFMTA is embracing this concept as part of our sustainable mobility strategy linking all modes under one system. We believe that this must be a local and national priority if we are to meet the needs of an increasingly urban society. one that places more emphasis on networked communications, mobility and access than on owning and operating a stand alone car. **This is not future dreaming, this is inevitable and the sooner we get on board the better.**

1AC—Solvency

Federal Support is Crucial to Create a Viable Electric Vehicle Infrastructure and Coordinate Local Programs

Oliver Hazimeh, director and head of the Global E-Mobility Practice at PRTM, “The Rapidly Approaching Tipping Point,” National Journal, June 22nd, 2010 (<http://transportation.nationaljournal.com/2010/06/what-should-transportation-dep.php>)

For the first time, industry and government – as well as public opinion – appear to be marching in lock-step toward an electrified vehicle (EV) future. The use of electricity as a fuel, however, requires unique and unprecedented coordination among automakers, utilities, internet service providers, commercial property owners and home builders. **Essential to making this nascent industry work and thrive will be a solid infrastructure supporting greater deployment of EVs.**

This needed infrastructure is not limited merely to convenient and accessible charging stations; rather, it must consist of an integrated end-to-end network that links together all disparate players, from physical home charge points enabled by smart metering to demand-response planning systems at utilities. **A comprehensive network—as convenient and ubiquitous as the gasoline pump—will be required.**

Several federal agencies, including the Department of Transportation, Department of Energy, Environmental Protection Agency and the Department of Treasury, are all playing vital roles in the development of this infrastructure. At a national level, each of them needs to provide the necessary resources and guidance for the United States to arrive at an integrated nationally compatible and economically viable electric transportation solution. The Department of Transportation, for example, has been tasked with providing an efficient transportation structure that protects our national interests. With daily reminders of the impact of oil dependency on our environment and our economy, the DOT’s mandate should include supporting an EV future.

Federal, state and local governments must employ a long-term view toward an inter-connected and seamless national network. Ideally, the efforts of the various federal agencies to help develop this infrastructure and “eco-systems” would include coordinated funding for state-level initiatives and ensuring that these locally run programs do not result in ad-hoc and incompatible local networks and are deployed with sufficient scale. Recently, the Electrification Coalition, an electric vehicle advocacy group, published the “Electrification Roadmap” which outlines an approach to developing local electrified ecosystems, which are coordinated at a national level. This proposition demonstrates how a coordinated EV infrastructure requires government participation at local and federal levels and it also suggests that a coordinated approach between the different federal departments requires a “central EV coordinator.”

1AC—Solvency

Electric Cars Reduce Emissions Considerably Now, But More Importantly, They Will Entail Even More Dramatic Reductions in the Near Future

The Guardian, "Carbon confusion: Just how green are electric vehicles?" March 11th, 2011

(<http://www.guardian.co.uk/electric-vision/electricity-supply-fossil-fuels>)

However, even on the current UK electricity supply, electric cars are greener than many conventional motors – partly because they are incredibly efficient. "Of the energy you're putting into an electric car when you plug it in, you probably get 80% to 90% translated into useful power at the wheels." say Professor Roger Kemp, author of a Royal Academy of Engineering (RAE) report on electric cars. "And that's really very good, because in a conventional car it's more like 20% to 30%, with the rest coming out as heat through the radiator and the exhaust pipe."

So how do electric cars compare with similar petrol and diesel cars when it comes to carbon emissions? According to the RAE, electric vehicles emit about 100g of CO2/km. Kemp argues that it is unfair to compare electric cars with large gas-guzzling cars such as 4x4s. If we look only at the three smallest categories of conventional car, average exhaust pipe emissions from new cars in 2009 were about 130g CO2/km. Emissions from producing the fuel (extracting and refining the oil) typically adds another 10% to 18% on top, bringing the total for new small cars in 2009 to 145-155g CO2/km.

Based on these figures, electric cars currently emit about a third less carbon on average than small conventional cars.

In terms of air quality, electric cars are streets ahead, because they don't release harmful pollution in densely populated city centres where it does most harm (although there is pollution from the power stations themselves). This is important since London, for example, is in breach of EU standards on dangerous airborne particles, and pollution causes more than 4,300 premature deaths a year in the capital.

But focusing on current performance misses the fundamental point, which is that electric cars have the potential to be dramatically cleaner in the future.

Dale Vince, founder of green energy firm Ecotricity calls electric cars "wind cars" to emphasise their ability to run on clean energy instead of oil. Thanks to our legally binding target to cut greenhouse gases by 80% by 2050, a huge shift towards low-carbon generation is required over the next 10 to 20 years. The UK has also committed to generating 15% of all energy and 30% of electricity from renewable sources by 2020.

The CCC suggests that in order to meet the 80% target by 2050, carbon emissions from electricity generation (which are easier than other sectors to reduce) need to decrease by about 90% by 2030, at which point "emissions from electric cars could become almost zero".

It's because of this promise of very low emissions in the future that the CCC is recommending an "ambitious trajectory for electric-car uptake", starting now. The CCC advises that to meet our climate-change targets, 16% of new cars should be electric by 2020, rising to 60% by 2030. By 2020 they recommend the UK has 1.7m electric cars on the road.

1AC—Solvency

Widespread Availability of Electric Cars Crucial to Preventing the Impacts of Global Warming

New York Times, "How Green Are Electric Cars? Depends on Where You Plug In," April 13th, 2012

(<http://www.nytimes.com/2012/04/15/automobiles/how-green-are-electric-cars-depends-on-where-you-plug-in.html?pagewanted=2&r=4&ref=energy-environment>)

Of course, conventional gas-powered vehicles are getting cleaner as engineering advances improve fuel economy and reduce emissions. On the other hand, electrics and plug-ins will become cleaner without technology changes as coal-burning power plants are replaced with natural gas, nuclear, hydroelectric, wind or solar facilities.

Don Anair, a senior engineer in the U.C.S. clean vehicles program, said utilities in the dirtiest electric-grid regions of the United States generate 2.5 to 3 times more global-warming emissions than those in the cleanest regions, so there is much room for improvement. But he sees **the industry trending in the right direction.**

"A number of old coal-fired power plants are now being retired," he said. "Given emission standards recently introduced by the current administration, any new coal-fired plants would be far cleaner than their predecessors." According to 2010 data from the United States Energy Information Administration, 45 percent of the country's electricity is generated by burning coal, the dirtiest fuel. Natural gas, a much cleaner fuel, accounts for 24 percent of electricity production, a figure that is shifting rapidly with price swings. Nuclear plants generate 20 percent of the nation's power, while wind, solar and [geothermal](#) sources provide 3 percent.

While the report puts hard numbers on the current situation, it also points out the need for fundamental changes.

"To prevent the worst consequences of global warming," the report concludes, "the automotive industry must deliver viable alternatives to the oil-fueled internal-combustion engine — i.e., vehicles boasting zero or near-zero emissions."

Advantage—Warming Anthropogenic and Dangerous**Warming is Anthropogenic and a Real Threat—Its Consequences Will Be Devastating**

Greg Laden, PhD, "[Why is Anthropogenic Global Warming Denialism Important?](http://scienceblogs.com/gregladen/2011/06/why_is_anthropogenic_global_wa.php)," Science Blogs, June 28th, 2011 (http://scienceblogs.com/gregladen/2011/06/why_is_anthropogenic_global_wa.php)

Global warming is for real, and it is important. Just as important is the fact that global warming is largely anthropogenic. Global warming is important because conditions for life on the planet are changing due to warming as well as other changes caused by the release of fossil carbon into the atmosphere, in ways that will have, on balance, negative impacts; That it is anthropogenic is important because this means we have identified a cause of an important negative effect and thus could potentially curtail it. The anthropogenic nature of global warming is also important for another reason: It provides a test case. Can humanity handle a problem of this magnitude, that it has created for itself, with sufficient speed to curtail the worse consequences? Or not?

It has been said that global warming is a mixed bag: For some it will be bad, for others it will be good. This is a myth. Global warming is on balance bad, and it is mostly bad. Never mind the extra CO₂ in the atmosphere that plants like, and which would increase agricultural productivity. Plants do not produce more tissue, fruit, grain, or what have you in direct proportion to the CO₂ in the atmosphere. A little, yes, but after a small increase in productivity more CO₂ does not increase productivity. The small amount of productivity is offset by the negative consequences of global warming.

It may be that the most significant impact of "global warming" will actually be not in atmospheric temperature change, but rather, in the change of ocean chemistry caused by absorption of extra CO₂. If ocean chemistry changes in a way that some models predict, it will become difficult for several kinds of small marine organisms to build their shells. Many of these organisms reside at or near the base of the marine food chain. Some also serve, collectively, as one of the primary means by which atmospheric CO₂ is broken down to produce atmospheric oxygen. Collectively, they are one (and an important one) of several "lungs of the planet." In the worse case, which may or may not happen, oxygen may become noticeably depleted in our atmosphere, and food supplies may be negatively affected.

Advantage—Now is the Key Time for Warming

We are Already Observing Dangerous Signs of Warming Taking Place—Waiting For the Later Signs Will Simply Be Too Late

Union of Concerned Scientists, "Sound Science for Public Policy," August 27th, 2008

(www.ucsusa.org/global_warming/science_and_impacts/science/sound-science-for-public.html)

Climate scientists -- and experts in related fields -- will continue their research to refine our understanding of the Earth's complex atmospheric system. However, despite the advances they have made, or perhaps because of them, climate science itself is under increasing attack in some media and policy forums. Ultimately, the best way to improve public understanding of global warming issues and to create a more receptive atmosphere for policy action is for scientists to repeatedly, patiently, and strategically present accurate, credible information to the media and policymakers. UCS's Sound Science Initiative is doing just that. Part of what scientists must do is to explain why it is unrealistic and unnecessary to expect total scientific certainty before taking appropriate action to address the threat of global warming. As climatologist Stephen Schneider notes, "I'm not 99 percent sure, but I am 90 percent sure [that the climate is changing]. Why do we need 99 percent certainty when nothing else is that certain? If there were only a 5 percent chance the chef slipped some poison in your dessert, would you eat it?" In the IPCC's latest assessment report (2007), the scientists drew some very strong conclusions about the present reality of climate change. The Panel concluded, for example, that human-induced warming over recent decades is already affecting many physical and biological processes on every continent. Nearly 90 percent of the 29,000 observational data series examined revealed changes consistent with the expected response to global warming, and the observed physical and biological responses have been greatest in the regions that warmed the most. Examples of observed changes in response to 20th century warming include Shrinking glaciers Thawing permafrost Earlier break-up of river and lake ice Lengthening of mid- to high-latitude growing seasons Poleward and altitudinal shifts of plant and animal ranges Declines of some animal and plant populations Earlier tree flowering, insect emergence and egg-laying in birds. Once we observe the more dramatic changes in response to climate change, by definition, it will be too late to take precautionary measures. And it may even be too late for the most cost-effective remedial measures. The IPCC's Fourth Assessment Report has made it clear that there are a variety of strategies available today that, if implemented quickly, can rein in global warming and avoid the most severe consequences. The impact of the more ambitious of these strategies on the world economy is expected to be a fraction of a percent reduction in the annual average growth rate of global gross domestic product (GDP). We also need strategies to cope with those consequences of global warming that are already unavoidable due to past emissions. Adaptation strategies are necessary to supplement climate change mitigation efforts. While IPCC reports are not policy-prescriptive, the analysis they provide is highly policy-relevant. IPCC reports are strong evidence that scientists' voices can make a difference in the public debate and in public policy to address this global problem.

Advantage—Warming Impacts (Environment)

Climate Change Will Decimate the Environment—Already Causing Natural Disasters and Wreaking Havoc on the Weather

Guy McPherson, Professor Emeritus of Natural Resources at the University of Arizona, “Three paths to near-term human extinction,” Transition Voice, November 9th, 2011 (<http://transitionvoice.com/2011/11/three-paths-to-near-term-human-extinction/>)

It's [hotter than it used to be](#), but not as hot as it's going to be.

The political response to this [now-obvious information](#) is to suspend the scientist bearing the bad news. Which, of course, is no surprise at all: As Australian scientist [Gideon Polya](#) points out, the US must cease production of greenhouse gases within about three years if we're to avoid catastrophic runaway greenhouse. I think Polya is optimistic, and I don't think Obama's on-board with the attendant collapse of the US industrial economy.

Climate change is one of three likely extinction events. Well, three I know about: I'm certain there are others, and any number can play.

[Back in the summer](#), the US had already tied its yearly record for the most billion-dollar weather disasters.

[Russia is headed directly](#) for loss of 30% of its permafrost by 2050. Tundra fires could [accelerate planetary warming](#). This year, the [Northeast Passage](#) was open as of July 27th. This is [a massively dire situation for the Arctic](#). In fact, we've passed a de facto [tipping point](#) with respect to Arctic ice. This [latter outcome is stunning](#), but only to those who follow the horrifically conservative and increasingly irrelevant Intergovernmental Panel on Climate Change.

Nature is responding with [hybrid bears](#), suggesting the near-term loss of all polar bears. Indeed, all [Earth's systems are rapidly declining](#). Many [organisms can't keep up](#) as they try to stay ahead of an overheating planet.

As the living planet decays, we keep piling on. Examples abound. Here's [one tiny example](#) among thousands, from that pesky BP well at Deepwater Horizon. It's out of the news cycle, but it's not done destroying life in the Gulf of Mexico. But perhaps this tidbit belongs beneath the heading of ...

We're headed for extinction via environmental collapse

[Nature is bankrupt](#), just like Wall Street and the USA. Thanks for playing, but you lose. The banksters on Wall Street “win.” But only in the short term. In the long run, we're all dead (as first stated by John Maynard Keynes).

Among the consequences of taking down a few hundred species each day: at some point, the species we take into the abyss is Homo sapiens (the “wise” ape). The vanishing point draws nearer every day. Our response, in the industrialized world: Bring on the toys. Burn all fossil fuels. Harvest the rain forests and strip-mine the soil. Pollute the water, eat the seed bank.

And, most importantly figure out how we can make a few bucks as the world burns.

We have our hand in [a monkey trap](#), and we can't let go.

Advantage—Warming Impacts (Extinction)**Reducing Carbon Emissions To Address Warming is Crucial For Global Survival**

Vikki Spruill, President and CEO The Ocean Conservancy, "IMPACT OF GLOBAL WARMING ON OCEANS," CQ Congressional Testimony, April 29, 2008, p. lexis

We stand at a crossroads, atop a mountain, but there is no ambiguity about which road goes straight toward the cliff and which toward home. We must make the right choice if we want to survive and prosper. The emission of greenhouse gases has to be slowed and ultimately stopped, and we have to act swiftly. We in the United States and in other developed countries enjoy an unprecedented quality of life, which is the envy of the rest of the world. But, that standard of living is expensive in the currency of carbon and it is not sustainable, especially with the rest of the world rapidly trying to emulate us. It is not sustainable if we do not take care of the ocean and the biosphere. We have a moral obligation to change our relationship with the planet. If we make those changes intelligently across all sectors of society and the economy, and if we undertake a 'mission-to-Mars' like development of new technology, then the changes have the chance to be more productive than painful. We may be able to cope and adapt to the changes that we see within our lifetimes without too much difficulty, but if we do not act now our children will suffer from our indecision and their children and grandchildren may lead much less rewarding lives, experience a significantly poorer standard of living, and face a world that is fundamentally more dangerous and uncertain. I have great faith in our ability to rise to this challenge, much as we have before when faced with global challenges to our way of life.

Nonetheless, our nation, its environment, economy, and people will be harmed by climate change. We face a twin challenge to mitigate its impacts and adapt to those which we cannot mitigate. We need strategies for responding to climate change impacts that will minimize the damage and cost of those impacts. We must get much better at anticipating what climate change is going to throw at us, and when and where those curve balls are going to appear. Adaptation to climate change will require significant investments in research, education, industry, and government, but it is within our capacity as a global society.

We have never faced a challenge of this magnitude before, but if we are willing to act now in collaboration with the World, we can succeed.

Advantage—Warming Impacts (Extinction)**Climate Change Will Cause a New Round of Big Extinctions—Humans Included**

ZeeNews, "Climate changes could lead to human extinction," June 19th, 2010 (http://zeenews.india.com/news/eco-news/climate-changes-could-lead-to-human-extinction_635160.html)

Sydney: Scientists have sounded alarm bells about how growing concentrations of greenhouse gases are driving irreversible and dramatic changes in the way the oceans function, providing evidence that humankind could well be on the way to the next great extinction.

The findings of the comprehensive report: "The impact of climate change on the world's marine ecosystems" emerged from a synthesis of recent research on the world's oceans, carried out by two of the world's leading marine scientists.

One of the authors of the report is Ove Hoegh-Guldberg, professor at The University of Queensland and the director of its Global Change Institute (GCI).

"We may see sudden, unexpected changes that have serious ramifications for the overall well-being of humans, including the capacity of the planet to support people. This is further evidence that we are well on the way to the next great extinction event," says Hoegh-Guldberg.

"The findings have enormous implications for mankind, particularly if the trend continues. The earth's ocean, which produces half of the oxygen we breathe and absorbs 30 percent of human-generated carbon dioxide, is equivalent to its heart and lungs. This study shows worrying signs of ill-health. It's as if the earth has been smoking two packs of cigarettes a day!," he added.

"We are entering a period in which the ocean services upon which humanity depends are undergoing massive change and in some cases beginning to fail", he added.

The "fundamental and comprehensive" changes to marine life identified in the report include rapidly warming and acidifying oceans, changes in water circulation and expansion of dead zones within the ocean depths.

These are driving major changes in marine ecosystems: less abundant coral reefs, sea grasses and mangroves (important fish nurseries); fewer, smaller fish; a breakdown in food chains; changes in the distribution of marine life; and more frequent diseases and pests among marine organisms.

Study co-author John F Bruno, associate professor in marine science at The University of North Carolina, says greenhouse gas emissions are modifying many physical and geochemical aspects of the planet's oceans, in ways "unprecedented in nearly a million years".

"This is causing fundamental and comprehensive changes to the way marine ecosystems function," Bruno warned, according to a GCI release.

Solvency—Demand Key to Solve**Demand is Crucial to Sustaining the Industry—Without Federal Support Industry Will Collapse**

MIT Technology Review, "Tough Times for U.S. EV Battery Makers," February 1st, 2012

(<http://www.technologyreview.com/energy/39578/>)

The U.S. government's effort to create an electric-vehicle battery industry suffered a setback last week when one of the companies it funded as part of this effort saw its parent company file for bankruptcy protection. Battery maker Enerdel had been awarded a \$118.5 million grant to build a lithium-ion battery factory in Indiana as part of a \$2 billion grant program for electric-vehicle component and battery manufacturing; its parent company is Ener1.

Ener1 hopes to emerge from bankruptcy, and says Enerdel will continue operations during bankruptcy proceedings. Yet its difficulties point to the challenges of creating a new industry: at least for now, there are too many companies chasing too few contracts for making electric- and hybrid-vehicle batteries.

Demand is expected to grow over the next few years as government regulations and incentives push automakers to roll out more battery-powered cars, and as technical and manufacturing advances make batteries cheaper. But for now, U.S. battery makers are competing in a tight market. Those that win key contracts—or that have large amounts of funding—will likely survive the next few years, while others could collapse.

Solvency—Government Infrastructure Key to Solve Warming**Government Action to Encourage Electric Vehicle Infrastructure is Crucial to Use EV Cars as a Step To Avoiding Climate Change**

[Cynthia J. Burbank](#) and Nick Nigro, National Planning and Environment Practice Leader at Parsons Brinckerhoff and solutions fellow at the Pew Center on Global Climate Change, “The Need For Public Policy,” National Journal, June 25th, 2010 (<http://transportation.nationaljournal.com/2010/06/what-should-transportation-dep.php>)

Historically, petroleum has been a key driver in the growth of the economy and development of nations worldwide. Gasoline and diesel fuel's impressive energy density, portability, and low production cost made it the fuel of choice for nearly a century. All the while there have been costs, although they haven't always been obvious. Petroleum's impact on climate change and U.S. energy security, and the risks of drilling, result in real and significant costs to society, and currently the price of petroleum does not include those externalities.

For climate change, the true costs to society are not fully known, but what is clear is that those costs will be significant and borne by all of society and not just those that are consuming petroleum -- unless action is taken. Furthermore, the U.S. has experienced the tribulations associated with energy security for decades beginning with the oil embargo of 1973 by OPEC. When the true costs of a product are not revealed by the market price, basic economics tells us to price that externality through public policy. This price is the primary role of government here.

However, transportation is such a complex system that correcting the price alone will not resolve these market failures. Government must do more to counterbalance the pervasive fueling infrastructure that we have built over the last century to support gasoline and diesel as well as the inertia of consumers' uneasiness with change. This is where U.S. DOT and state transportation departments can help.

Transportation departments and state governments more broadly can incentivize the purchase and use of PEVs through a number of policies under their influence or control, such as HOV access, reduced tolling fees, parking privileges, public charging infrastructure support, public education, tax incentives, and transportation planning analyses that highlight the effects of increasing PEVs – as opposed to not taking action.

Solvency—Infrastructure Key to Adoption**Charging Infrastructure Overall is the Crucial Step to Wide-Scale EV Adoption**

Dave McCurdy, President and CEO, American Gas Association, "Electric Ready," National Journal, June 21st, 2010 (<http://transportation.nationaljournal.com/2010/06/what-should-transportation-dep.php>)

Access to reliable home charging infrastructure is a requirement for the deployment of plug-in hybrid electric vehicles and battery electric vehicles. Although 110/120 volt outlets are available in the home, the circuit/panel inside the home may not currently be able to provide reliable support for the vehicle charger.

While the majority of charging is likely to occur at the home or workplace, publicly available charging access will be important to ensure the successful adoption of battery electric vehicles and plug-in hybrid electric vehicles. To gain widespread usage of battery electric vehicles, the issue of consumer "range anxiety" must be addressed. In the near term, access to public stations will provide the necessary reassurances to drivers of battery electric vehicles and plug-in hybrid electric vehicles that they will have the ability to recharge at locations other than home and work. Publicly available sites also serve to increase consumer awareness of electrification as a viable alternative to traditional energy technologies.

Solvency—Electric Cars Solve Emissions/Smart Grid**Widespread Adoption of Electric Vehicles Will Stabilize the Electric Grid and Encourage Renewable Energies**

Phys.org, "With a smart grid, plug-in hybrid electric vehicles could have system benefits," February 26th, 2007 (<http://phys.org/news91731110.html>)

Xcel Energy announced the results of a six-month study related to plug-in hybrid electric vehicles (PHEVs) and how an increase in their popularity may affect Colorado. The study found that PHEVs may result in a reduction of the overall expense of owning a vehicle and, with the help of smart-grid technologies, eliminate harmful vehicle emissions by up to 50 percent.

The study looked at how adding PHEVs to the road could affect the electric power grid depending on when and where the cars were charging. It also looked at the overall emission footprint of these vehicles, the decreased vehicle fuel costs and how PHEVs could impact the company's production and capacity costs.

Xcel Energy's Utility Innovations group worked with the U.S. Department of Energy's National Renewable Energy Laboratory (NREL) on the study. A cutting-edge computer-modeling program was used to measure the impact of a mass penetration of PHEVs and how much energy would be required to charge them.

NREL's program was able to simulate adding vehicles to the roads in large increments, under real driving conditions, simulating an increase in the market penetration of these vehicles. The study revealed that these cars, each equipped with a 9 kilowatt-hour battery, could reduce overall CO2 vehicles emissions by half. They could also save owners more than \$450 in fuel costs each year compared to a traditional combustion engine vehicle.

"Hybrid gas/electric vehicles are already on the market and PHEVs are staged for growth, so we wanted to know how that could affect our business," said Mike Carlson, CIO, Xcel Energy. "Depending on when customers choose to recharge, adding PHEVs to the road may help reduce overall emissions of CO2 without significant increases in utility infrastructure. In other words, PHEVs could be one piece of the puzzle to solving our global climate change problem."

How much would be saved in vehicle emissions depends on when drivers charge their cars. Incentive programs may induce customers to charge their PHEVs at certain times and will help Xcel Energy minimize emissions and operating costs as well as incremental utility infrastructure investment. "Successfully managing a charging program will depend on a smart utility grid," said Ray Gogel, chief administrative officer for Xcel Energy. "This study is one step we are taking to demonstrate how to use energy more efficiently through smart-grid technologies. In order to make a dent in issues like climate change and dependence on foreign oil, the grid must change. Plug-in hybrid electric vehicles have the potential to help us better use renewable and other nontraditional energy sources while creating a grid that is more interconnected, balanced and reliable."

Solvency—Electric Cars Solve Emissions**Electric Cars Save Fuel and Emissions Overall—Even Accounting for Coal, They are Extremely Efficient**

CT News Junkie, "Building An Electric Vehicle Infrastructure," June 20th, 2011

(http://www.ctnewsjunkie.com/ctnj.php/archives/entry/building_an_electric_vehicle_infrastructure/)

Collins, who drove to the Goodwin College forum in a Chevrolet Volt, estimated energy costs for an electric vehicle to be around \$600, compared to \$2,000 he estimated for traditional gas powered vehicles.

But not all electricity is considered clean since some is generated by dirty energy sources, such as coal.

Matt Solomon, transportation manager for Northeast States for Coordinated Air Use Management, believes the carbon emissions of electric vehicles will still fall far below gasoline.

Coal is a carbon intense fuel, but Solomon said that no system is primarily reliant on coal as the source of energy and other sources contribute to available electricity on the grid.

"When you do the math on the emissions, I can say that the life of the vehicle running on electricity from coal is equivalent to a really high efficiency hybrid getting 50 miles to a gallon," said Collins.

AT: Electric Cars Overwhelm the Grid**Electric Cars Save Energy and Help Balance the Power Grid**

[Jan Mueller](#), Senior Policy Associate, Environmental and Energy Study Institute, "[What Should Transportation Departments Do For Electric Cars?](#)" National Journal, June 21st, 2010
(<http://transportation.nationaljournal.com/2010/06/what-should-transportation-dep.php>)

Electric vehicles can also have significant value for managing the electricity grid. Electric cars will typically be parked for most hours of the day. When they are plugged in and connected to the grid, they can provide important storage, frequency regulation, and load management services. Revenues for these services can be substantial—up to [\\$3000 per vehicle per year](#) in initial pilot projects. Industry observers have also suggested that the performance advantages of electric cars may command a higher consumer price—e.g. the high torque of electric motors provides for exceptionally rapid, smooth, and quiet acceleration relative to conventional engines.

AT: Charging Stations Too Hard to Find**Google Efforts Will Enable Consumers to Easily Find Charging Stations**

SmartPlanet.com, "Department Of Energy partners with Google to promote electric vehicles," April 20th, 2012 (<http://www.smartplanet.com/blog/transportation/department-of-energy-partners-with-google-to-promote-electric-vehicles/339>)

Even if every major car manufacturer comes out with an electric car in the next few years, for plug-in vehicles to truly become mainstream we're going to need well-established infrastructure. In line with that, Energy Secretary Steven Chu [announced](#) a new partnership with the Department of Energy and Google to provide drivers with location data for charging stations, and \$5 million in funding for cities to support electric vehicle infrastructure.

The initiative is part of the federal government's Clean Cities program, that encourages local governments to deploy clean technologies, including alternative fuels. Since it began in 1993, the program has helped save nearly 3 billion gallons of gasoline, the DOE said.

"The Department of Energy's Clean Cities initiative is bringing together local governments and industry to demonstrate the benefits of advanced technology vehicles and help communities use less oil and gasoline to power their vehicles," said Secretary Chu. "The initiatives announced today are just the latest steps in our broader efforts to reduce America's dependence on oil, improve our energy security, and save families and businesses money."

The DOE's National Renewable Energy Laboratory (NREL) is working with Google and other industry leaders to give consumers up-to-date information about EV charging station locations. The effort will use Google Maps as the "primary data source for GPS and mapping services".

AT: Volt Proves the Tech Doesn't Work**The Volt is Just Getting Started, Of Course its Not Perfect Yet—Federal Support For Charging Stations Will Allow it to Expand**

New York Times, "The Electric Car, Unplugged," March 24th, 2012 (<http://www.nytimes.com/2012/03/25/sunday-review/the-electric-car-unplugged.html?pagewanted=all>)

But he added that the Volt was an incredibly complicated device in the early stages of development. "When you push the start button, you've got 10 million lines of software running. On an F-15, it's about eight million lines of code. You're really driving a modern data center, and a lot can go wrong."

He noted that the current Volt was the first generation and predicted that its third version, which will come between 2020 and 2025, will gain wide acceptance, as long as G.M. does not end the project and the government backs a nationwide infrastructure of charging stations.

AT: Coal Electricity Kills Solvency**Even Accounting for Coal Power Generation, Electric Cars are Substantial Emissions Reductions**

The Economist, "Difference Engine: Tailpipe truths," April 12th, 2012

(<http://www.economist.com/blogs/babbage/2012/04/electric-cars>)

In many parts of the world, electricity is generated mainly from coal—a dirty fuel that casts a pall over the electric vehicle's pristine image. The UCS report, "[State of Charge](#)", seeks to clarify such matters. The UCS finds that electric vehicles charged from the grid produce lower emissions than a petrol-powered car that gets 27mpg. And they did so, the report claims, even in places where the electricity is produced primarily from coal.

To get a handle on the problem, the UCS researchers divided America into 13 regions, which they then classified as good, better and best for charging purposes. Overall, coal accounts for 45% of America's electricity production, natural gas 24%, nuclear 20%, hydro 6%, renewables 4% and oil just 1%. The emissions produced in replenishing an electric car's batteries depend on the mix of energy sources used to power a region's electricity grid. Places that are best for charging electric vehicles—California and parts of New York—have the lowest proportion of coal-fired capacity and the highest proportion of hydro and renewable sources in their generating mix.

The UCS's well-to-wheels analysis shows that a battery-powered vehicle charged with electricity made from coal produces as much in the way of greenhouse gases as a conventional car that averages 30mpg. If the electricity is generated solely from natural gas, the emissions are equivalent to a petrol-powered car averaging 54mpg. And if the batteries are recharged using solar power, it is like having a car capable of 500mpg.

AT: Coal Electricity Kills Solvency**EV Cars Reduce Emissions Dramatically and Will Get Better as Standards are Increased**

Carol Werner, Executive Director, "Study: Electric Car Greenhouse Gas Emissions Vary by Local Energy Sources," Climate Change News, April 23rd, 2012 (http://www.eesi.org/ccn_042312)

A recent study from the Union of Concerned Scientists (UCS) compared the greenhouse gas emissions of electricity produced in different regions to power the all-electric Nissan Leaf versus the emissions of hybrid and conventional gasoline vehicles. The study found that 45 percent of U.S. residents live in areas where powering an electric vehicle is equivalent to a gasoline vehicle that attains 50 miles per gallon (mpg) or more and equivalent to over 80 mpg in certain areas, including parts of New York and California. Another 37 percent of Americans live in areas where power plant emissions for electric cars are at the equivalent of 41-50 mpg, comparable to hybrid cars. An electric car in a region totally reliant on coal power would be equivalent to 30 mpg; on par with conventional gasoline cars. "The good news is that, as the nation's electric grids get cleaner, consumers who buy an EV today can expect to see their car's emissions go down over the lifetime of the vehicle," said report author Don Anair. Electric vehicles provide protection against changing gas prices, and the report estimates \$13,000 fuel savings over an average car lifetime, compared to a 27 mpg conventional car. The UCS report also stated a need for systemic change, "To prevent the worst consequences of global warming, the automotive industry must deliver viable alternatives to the oil-fueled, internal-combustion engine — i.e., vehicles boasting zero or near-zero emissions."

AT: Warming Fake

Warming is Real and Human Caused—Alternate Explanations of Climate Deniers are Lies By the Industry

John Cook, Climate Communication Fellow for the Global Change Institute at the University of Queensland, "How we know we're causing global warming in a single graphic," Skeptical Science, July 27th, 2011

(<http://www.skepticalscience.com/How-we-know-were-causing-global-warming-in-single-graphic.html>)

The first point to establish is that humans are the cause of the rise in atmospheric CO₂ levels. This fact is common sense. The amount of CO₂ in the atmosphere is going up by around 15 billion tonnes per year. Humans are emitting around twice that much! On top of this, there are a number of lines of evidence to confirm that we're the cause of rising CO₂ levels. When we measure the type of carbon accumulating in the atmosphere, we observe more of the type of carbon that comes from fossil fuels ([Manning 2006](#)). As you burn fossil fuels, you take oxygen out of the atmosphere. Measured oxygen levels are falling in line with the amount of carbon dioxide rising ([Manning 2006](#)). There's been a sharp rise in "fossil fuel carbon" in corals ([Pelejero 2005](#)) and sea sponges ([Swart 2010](#)). Anthropogenic CO₂ is penetrating even to the ocean depths ([Murata 2010](#)). Measurements of radiocarbon in tree-rings confirms human activity is the cause of rising CO₂ ([Levin 2000](#)). Even the [pages of ancient books](#) trace the rising effects of fossil fuel pollution going back to beginnings of the industrial revolution ([Yakir 2011](#)).

So many independent lines of evidence (and common sense) confirm that yes, we are responsible for the recent rise in atmospheric CO₂.

The extra CO₂ is trapping heat

Our understanding of the greenhouse effect provides a number of verifiable predictions. If carbon dioxide is trapping more heat, we should see [less heat escaping to space](#). Satellites measuring infrared radiation coming from Earth find less heat escaping to space over the last few decades, at those exact wavelengths that carbon dioxide absorbs energy ([Harries 2001](#), [Griggs 2004](#), [Chen 2007](#)). The researchers who analysed this data described this as:

"...direct experimental evidence for a significant increase in the Earth's greenhouse effect".

[Harries 2001](#)

If less heat is escaping to space, there's only one place it can go - back to the Earth's surface. Scientists check this by measuring infrared heat coming down from the atmosphere. These measurements confirmed the satellite data - more heat is returning to the Earth's surface ([Philipona 2004](#), [Evans 2006](#), [Wang 2009](#)). This extra piece of evidence upon the existing body of evidence led scientists to conclude that:

"This experimental data should effectively end the argument by skeptics that no experimental evidence exists for the connection between greenhouse gas increases in the atmosphere and global warming."

[Evans 2006](#)

Unfortunately the scientists underestimated the human capacity to ignore evidence staring us in the face.

Global warming has a distinct greenhouse signature

As far back as the mid 1800s, Tyndall predicted that greenhouse warming should cause [nights to warm faster than days](#).

This is because at night, the Earth's surface cools by radiating heat out to space. Greenhouse gases trap some of this heat, slowing the night-time cooling. It took over 130 years before Tyndall's prediction was confirmed. Over the last few decades, surface measurements have observed nights warming faster than days ([Braganza 2004](#), [Alexander 2006](#), [Zhou 2009](#)).

Tyndall made another prediction of what greenhouse warming should look like. Just as greenhouse gases slow down nighttime cooling, they also slow down winter cooling. So Tyndall anticipated [winters warming faster than summers](#). Again, recent analysis of temperature trends over the last few decades bear this out ([Braganza et al 2003](#), [Braganza et al 2004](#)).

Both thermometers and satellites find winters warming faster than summers.

And the evidence continues to build. Another distinctive greenhouse pattern can be found in the atmosphere. With heat being trapped, we expect to see the lower atmosphere to warm. But with less heat escaping to space and more carbon dioxide in the stratosphere, [we also expect to see the upper atmosphere cool](#). Satellites and weather balloons both observe this curious contrast between upper cooling and lower warming ([Jones 2003](#)).

With the lower atmosphere (the troposphere) warming and the upper atmosphere (the stratosphere) cooling, the boundary between the troposphere and stratosphere, otherwise known as the tropopause, should rise as a consequence of greenhouse warming. This has been observed ([Santer 2003](#)). An even higher layer of the atmosphere, the ionosphere, is expected to cool and contract in response to greenhouse warming. Satellites measure this effect ([Laštovika 2006](#)). We are changing the very structure of our atmosphere.

What's fascinating about all these greenhouse signatures is they also rule out a number of other potential causes of global warming. If the sun was causing global warming, it would cause summers to warm faster than winter, days to warm faster than nights and the upper atmosphere to warm. [Observations rule out the sun](#).

Similarly, the pattern of ocean warming rules out ocean cycles as the driver of global warming. The world's oceans have been building up heat over the past half century. This isn't a case of heat shifting around due to ocean cycles but the entire global ocean system building up heat. The specific pattern of ocean warming, with heat penetrating from the surface, can only be explained by greenhouse warming ([Barnett 2005](#)).

If it walks like a duck and quacks like a duck...

Current global warming shows all the distinctive signatures of greenhouse warming. To be skeptical that humans are causing global warming, you must believe two things. Something unknown is causing warming that happens to mirror the greenhouse effect. And something unknown is somehow suppressing the well understood (and well observed) greenhouse effect. So we can accept what we know to be true (greenhouse warming) or we accept two unknowns.

The saying goes if it walks like a duck and quacks like a duck, then it must be a duck. But climate skeptics are trying to convince us it's some other, undefined animal impersonating a duck that's also mysteriously hiding the real duck.

AT: Warming Will Be Slow/Negative Feedbacks**Feedbacks are Positive and Will Cause Rapid Increases in Warming**

James E. Hanson, Head, NASA Goddard Institute, Testimony before House Select Committee on Energy, June 23rd, 2008 (www.columbia.edu/~jeh1/2008/TwentyYearsLater_20080623.pdf)

Fast feedbacks—changes that occur quickly in response to temperature change—amplify the initial temperature change, begetting additional warming. As the planet warms, fast feedbacks include more water vapor, which traps additional heat, and less snow and sea ice, which exposes dark surfaces that absorb more sunlight. Slower feedbacks also exist. Due to warming, forests and shrubs are moving poleward into tundra regions. Expanding vegetation, darker than tundra, absorbs sunlight and warms the environment. Another slow feedback is increasing wetness (i.e., darkness) of the Greenland and West Antarctica ice sheets in the warm season. Finally, as tundra melts, methane, a powerful greenhouse gas, is bubbling out. Paleoclimatic records confirm that the long-lived greenhouse gases—methane, carbon dioxide, and nitrous oxide—all increase with the warming of oceans and land. These positive feedbacks amplify climate change over decades, centuries, and longer. The predominance of positive feedbacks explains why Earth's climate has historically undergone large swings: feedbacks work in both directions, amplifying cooling, as well as warming, forcings. In the past, feedbacks have caused Earth to be whipsawed between colder and warmer climates, even in response to weak forcings, such as slight changes in the tilt of Earth's axis.² The second fundamental property of Earth's climate system, partnering with feedbacks, is the great inertia of oceans and ice sheets. Given the oceans' capacity to absorb heat, when a climate forcing (such as increased greenhouse gases) impacts global temperature, even after two or three decades, only about half of the eventual surface warming has occurred. Ice sheets also change slowly, although accumulating evidence shows that they can disintegrate within centuries or perhaps even decades. The upshot of the combination of inertia and feedbacks is that additional climate change is already "in the pipeline": even if we stop increasing greenhouse gases today, more warming will occur. This is sobering when one considers the present status of Earth's climate. Human civilization developed during the Holocene (the past 12,000 years). It has been warm enough to keep ice sheets off North America and Europe, but cool enough for ice sheets to remain on Greenland and Antarctica. With rapid warming of 0.6°C in the past 30 years, global temperature is at its warmest level in the Holocene.³ The warming that has already occurred, the positive feedbacks that have been set in motion, and the additional warming in the pipeline together have brought us to the precipice of a planetary tipping point. We are at the tipping point because the climate state includes large, ready positive feedbacks provided by the Arctic sea ice, the West Antarctic ice sheet, and much of Greenland's ice. Little additional forcing is needed to trigger these feedbacks and magnify global warming. If we go over the edge, we will transition to an environment far outside the range that has been experienced by humanity, and there will be no return within any foreseeable future generation. Casualties would include more than the loss of indigenous ways of life in the Arctic and swamping of coastal cities. An intensified hydrologic cycle will produce both greater floods and greater droughts. In the US, the semiarid states from central Texas through Oklahoma and both Dakotas would become more drought-prone and ill suited for agriculture, people, and current wildlife. Africa would see a great expansion of dry areas, particularly southern Africa. Large populations in Asia and South America would lose their primary dry season freshwater source as glaciers disappear. A major casualty in all this will be wildlife.

AT: Climate Skeptics**Climate Skeptics are Paid Off By Big Industry—Their Conclusions and Data are All Falsified**

George Monbiot, Political and Environmental Activist, "Big Oils Big Lie," THE GUARDIAN, June 23rd, 2008
(<http://www.guardian.co.uk/environment/georgemonbiot/2008/jun/23/week>)

Of course, it's not a crime, and it's hard to see how, in a free society, it could or should become one. But the culpability of the energy firms the climate scientist James Hansen will indict in his testimony to Congress today is clear. If we fail to stop runaway climate change, it will be largely because of campaigning by oil, coal and electricity companies, and the network of lobbyists, fake experts and thinktanks they have sponsored. The operation sprang directly from Big Tobacco's war against science. It has used the same fake experts, the same public relations companies and the same tactics: as I showed in my book *Heat*, the campaign against action on climate change was partly launched by the tobacco company Philip Morris. But while the tobacco companies' professional liars were smoked out by a massive class action in the US, the sponsored climate change deniers still have massive influence over public perception. A survey published yesterday by the Observer shows that six out of ten people in Britain agreed that "many scientific experts still question if humans are contributing to climate change." This is an inaccurate perception, which results from Big Energy's lobbying. Almost without exception, the scientists who claim to doubt that manmade climate change is taking place fall into two categories: either they are not qualified in the branch of science they are discussing or they have received money from fossil fuel companies. Of all the self-professed climate "sceptics", I have been able to find only one – Dr John Christy of the University of Alabama – who has relevant qualifications and who does not appear to have received fees from lobby groups or thinktanks sponsored by the energy companies. But even he has had to admit that the figures on which he based his claims were the results of "errors in the ... data". The others are the very opposite of sceptics. Many of them are paid to start with a conclusion – that climate change isn't happening or isn't important – then to find data and arguments to support it. In most cases, they cherry-pick scientific findings; in a few cases, like the fake scientific paper attached to the celebrated Oregon petition, they make them up altogether. But people who don't understand the difference between a peer-reviewed paper and a pamphlet are taken in. The energy companies' propaganda campaign is amplified by scientific illiterates in the media, such as Melanie Phillips, Christopher Booker, Nigel Lawson, Alexander Cockburn and the television producer (who made Channel 4's documentary *The Great Global Warming Swindle*) Martin Durkin. I don't believe that the energy companies should be prosecuted for commissioning the truckload of trash their sponsored experts publish. But their campaign of disinformation must be exposed again and again. Like the tobacco lobbyists, they are not only delaying essential public action; they also create the impression that science is for sale to the highest bidder. The awful truth is that sometimes it is.

AT: CO2 Good (Species)**Climate Change Will Case Species Extinctions, Can't Be Adapted To**

Earth Times, "Climate change extinction risk 'greatly underestimated,'" January 4th, 2012

(<http://www.earthtimes.org/climate/climate-change-extinction-risk/1737/>)

Climate change could cause many more animal and plant extinctions than previously thought, ecologists say. Most previous climate change modelling has not taken into account the movement and competition among species, a new study claims.

Assistant Professor Mark Urban, from the University of Connecticut, who headed-up the report, says, "We have really sophisticated meteorological models for predicting climate change, but in real life, animals move around, they compete, they parasitize each other and they eat each other. The majority of our predictions don't include these important interactions."

Many studies show that species do move because of climate change, such as when temperatures rise, animals and plants move to higher ground to escape from the heat, says Assistant Professor Urban.

What they may not take into account is that species may die off before accessing improved habitat or may lose out to rival species already there or who have arrived previously.

Assistant Professor Urban, along with Kimberly Sheldon and Josh Tewksbury, from the University of Washington, have devised a model that predicts how successful species might be when moving to new habitats, by including migration and competition factors.

Species that are flexible enough to adapt to climate change will have a better chance of survival, they have found.

Those who are not able to move far or need specific habitats or requirements are more likely to die off, according to the modelling.

Assistant Professor Urban explains, "When a species has a small range, it's more likely to be out competed by others. It's not about how fast you can move, but how fast you move relative to your competitors."

He illustrates the problem by comparing it to a mountain train, where each carriage represents a species. If all carriages move at the same speed, they reach the top at the same time. But if they could each travel at different speeds, there would be chaos.

"There's always a car in front of you and a car behind. When you introduce the ability to move at different speeds, they're constantly bumping into one another, even running each other over. It's a recipe for disaster."

All this means that many estimations of species loss due to climate change, could greatly underestimate levels of extinction.

AT: CO2 Ag

**New Research Indicates the Carbon Fertilization Effect Is Smaller than Anticipated—
Especially Small in the Most Important Crops**

BBC News, "Climate food crisis 'to deepen,'" September 5th, 2005

(<http://news.bbc.co.uk/2/hi/science/nature/4217480.stm>)

Scientists there have been growing crops in the field and exposing them to elevated levels of carbon dioxide via a system of pipes and valves controlled by computer.

Previous greenhouse studies had suggested that higher levels of CO₂ - which plants take out of the atmosphere to make food for themselves - would actually help boost yields in some places in the coming years.

And some assessments have indicated this may actually offset losses projected to come from changes in precipitation and rising temperatures elsewhere on the planet.

'Social justice'

But the Illinois work points to a more pessimistic outcome, the university's Professor Steve Long told the meeting.

"The alarming result is that the yield increase we see due to raised carbon dioxide is only about half that predicted and in the case of maize - and last year there was more maize than any other crop in terms of tonnes globally - we see no increase at all," he said.

These Free Air Concentration Enrichment (Face) experiments are among the first that try to replicate real field conditions. They were run on a range of crops such as rice, wheat, maize and soya, and showed the hoped for gains in a CO₂-rich world to be unachievable in all of them.

AT: SO2 Screw**SO2 Emissions are Already Being Massively Decreased, They Don't Accompany CO2**

Robert **KRIPOWICZ**, Acting Assistant Secretary for Fossil Fuel Energy, "Prepared Testimony before Senate Committee on Environment and Public Works, Subcommittee on Clean Air, Wetlands and Climate Change," Federal News Service, January 29th, 2002, p. **lexis**

The investment has returned dividends. By installing new technologies to capture particles of fly ash, the power industry has dramatically reduced particulate matter governed by the PM-10 national air quality standard. The power industry has also installed sulfur dioxide controls on more than 90,000 megawatts of capacity as part of a successful effort that has cut SO2 emissions substantially since 1970. Many of the nation's coal-fired plants have also installed nitrogen oxide controls that have helped keep these emissions in check until more substantial controls are placed on these units in the future.

AT: Natural Gas CP**Natural Gas Cars Cause Methane Leakage and Rapid Warming**

Treehugger.com, "Natural Gas Vehicles Less Climate-Friendly Than Thought, Methane Leaks To Blame," April 11th, 2012 (<http://www.treehugger.com/fossil-fuels/natural-gas-vehicles-less-climate-friendly-than-thought-methane-leaks.html>)

There have been a near surfeit of reports recently looking at the [greenhouse gas emissions of natural gas](#), most of which have concluded that, to varying degrees, we're underestimating emissions, the effects of [methane leakage](#) on those, and natural gas isn't always as climate-friendly as claimed.

The latest of these has just been published in [Proceedings of the National Academy of Sciences](#).

It's a free read, so I'll leave the nitty-gritty details to the report authors, associated with the Environmental Defense Fund, Princeton University, Duke University, and the Rochester Institute of Technology. Here's the gist of it:

We find that a shift to compressed natural gas vehicles from gasoline or diesel vehicles leads to greater radiative forcing of the climate for 80 or 280 yr, respectively, before beginning to produce benefits. Compressed natural gas vehicles could produce climate benefits on all time frames if the well-to-wheels [methane] leakage were capped at a level 45-70% below current estimates.

By contrast using natural gas instead of coal for electric power plants can reduce radiative forcing immediately, and reducing [methane] losses from the production and transportation of natural gas would produce even greater benefits.

AT: Private CP

Only Transportation Departments Have the Necessary Experience to Maximize Charging Infrastructure

Colin F. Peppard, Transportation Policy Advocate, Natural Resources Defense Council, "Start With The Infrastructure," National Journal, June 21st, 2010 (<http://transportation.nationaljournal.com/2010/06/what-should-transportation-dep.php>)

The location of non-residential infrastructure will need to be carefully planned to accommodate such consumer prerequisites. DOT traffic engineers and planners are well suited to analyzing both existing travel patterns and planned development to help determine, in conjunction with utilities, automakers, charging service providers, and other agencies, the most suitable locations and amount of public infrastructure needed, ensuring that funds are well spent. Moreover, new infrastructure can be designed to best take advantage of existing public and private charging options. Deploying charging infrastructure will also require a significant engineering and construction effort. While utilities experienced in large public works projects will undertake a portion of this task, transportation agencies also have significant experience planning and managing large infrastructure projects. This includes an extensive network of transportation construction contractors that needed to deploy sufficient charging infrastructure along our transportation system.

AT: States

Only Integrated Federal Support Will be Able to Piece Together Everything Necessary to Accelerate Electric Cars to Viability

[Rob McCulloch](#), Senior Policy and Legislative Advocate, BlueGreen Alliance, "Build on Investment, Interagency Success," National Journal, June 24th, 2010 (<http://transportation.nationaljournal.com/2010/06/what-should-transportation-dep.php>)

Now is the time for the rubber to meet the road when it comes to creating infrastructure that makes vehicle electrification more practical for consumers and communities.

Let's build on the success of these interagency endeavors, and get DOE in the fold to integrate vehicle electrification within these efforts. A strategic alliance between DOT and DOE is key since these agencies will see significant overlap in linking our transportation systems to the electrical grid and information networks.

Pieces of this puzzle now exist in other parts of the ARRA, and resources could be increased through several bills aimed at advanced vehicle deployment and infrastructure now in the House and Senate. Recent iterations of comprehensive climate and energy legislation, including the American Clean Energy and Security Act (ACESA) that passed the House last summer, would invest billions more in clean vehicle production (Section 136) and supporting infrastructure, and final Senate climate/energy legislation should at least match advanced vehicle investments passed in ACESA.

The resources, community support and political will are there, and growing. Now it's time to put the puzzle pieces together, and also pass advanced vehicle and climate/energy legislation. Then we will see hybrid and electric vehicles grow beyond a niche and into a significant slice of the U.S. auto market, creating significant employment within U.S. manufacturing and infrastructure sectors and accelerating our shift to a clean energy future.

AT: States**Federal Authority is Crucial to Create Cooperation With Utility Industries and Ready a National Roll-Out**

Dave McCurdy, President and CEO, American Gas Association, "Electric Ready," National Journal, June 21st, 2010 (<http://transportation.nationaljournal.com/2010/06/what-should-transportation-dep.php>)

The recent joint final EPA/NHTSA rulemaking on greenhouse gas emissions and Corporate Average Fuel Economy establishes a policy of requiring manufacturers of plug-in hybrid electric vehicles, battery electric vehicles, and fuel cell vehicles to account for upstream emissions from electricity generation (i.e., the emissions of utilities in effect become the responsibility of the automotive sector).

This policy discourages future production of plug-in electric vehicles by making automobile manufacturers responsible for the electric energy mix of the country or a given state. Automakers cannot control fuel production (including electricity or any other fuel) nor can they control how much the vehicle is driven. Clearly public policies and programs to address upstream emissions and vehicle travel are needed. However, requiring automakers to account for – despite having no control over – upstream emissions will increase compliance burdens, create planning uncertainty, and put large-scale investments at risk, hampering the launch of electric mobility.

Vehicle electrification requires supportive investments by the utility industry. Local distribution networks for the grid may be stressed if multiple vehicles begin charging at the same time, or if transformers are not allowed to properly cool during the evening. The potential for unintended consequences exists and efforts by both industries need to be well-coordinated. The federal government should support a framework for the automotive industry to work with the utility industry to develop a roadmap and investment plan that reflects future plug-in hybrid electric vehicle and battery electric vehicle energy requirements as part of larger grid modernization efforts.

Politix—Popular**Electric Cars Universally Politically Popular, The Issue Transcends Partisan Lines**

Triple Pundit, "Electric Vehicles: Federal Funding and Bi-Partisan Support," June 21st, 2011

(<http://www.triplepundit.com/2011/06/electric-vehicles-house-resolution-1685/>)

Advocates of electric vehicles are found throughout our political spectrum from environmentalists seeking to address climate change issues to national security analysts endorsing a reduction in the import of foreign oil. Whether the motivation is the environment or national security, one of the most noteworthy accomplishments of the burgeoning electric vehicle industry is its ability to transcend traditional, partisan lines. This cooperation is on display in two bills currently working their way through the U.S. House of Representatives and the Senate. House Resolution 1685, [titled the Electric Drive Vehicles Deployment Act of 2011](#), is currently being reviewed by the House Subcommittee on Highways and Transit. The Senate version – [bill 948 titled the Promoting Electric Vehicles Act of 2011](#) – is also mired in review, in the Committee on Energy and Natural Resources. Commonalities exist between the two bills including, most significantly, bipartisan support that bodes well for the future of the electric vehicle industry.

Politix—GOP Hates Electric Cars

Electric Cars are a GOP Punch Line—Expanding Support Will Anger Them

AOL Autos, "[Why Gingrich And GOP Bash Electric Vehicles](http://autos.aol.com/article/why-gingrich-and-gop-bash-electric-vehicles/)," February 22nd, 2012 (<http://autos.aol.com/article/why-gingrich-and-gop-bash-electric-vehicles/>)

Republicans vying for the White House and members of Congress looking to appeal to part of their "base" constituents enjoy ridiculing the extended range electric Chevrolet [Volt](#), as well as other [electric vehicles](#) they don't see as viable, attractive to drive or even manly.

Former Speaker of the House Newt Gingrich, addressing Georgia and Oklahoma Republicans this week singled out the Volt, saying: "You can't put a gun rack in a Volt." The line drew cheers. "We believe in the right to bear arms and we like to bear the arms in our [trucks](#)." The full context of Gingrich's screed was a general opposition to the Obama White House's support of investments in alternative energy and what the presidential candidate sees as the President's inaction to stem rising gasoline prices.

[General Motors](#) public relations chief Selim Bingol responded: "Newt Gingrich has taken up saying that 'You can't put a gun rack on a Volt.' That's like saying 'You can't put training wheels on a Harley.' Actually, you can. But the real question is 'Why would you?' In both examples: It looks weird. It doesn't work very well, and, there are better places for gun racks and training wheels - [pickup trucks](#) and little Schwinn's, respectively." Bingol added: "Seriously, when is the last time you saw a gun rack in ANY [sedan](#)?"

The Volt has been a favorite target of Republicans over the past several months. Republicans have opposed federal tax credits for electric vehicles. The Volt is eligible for a credit up to \$7,500 and the White House is proposing raising it to \$10,000 for all [EVs](#).

Republicans have also tied the Volt to the White House's decision to bail out [GM](#) with taxpayer funds in 2009 with a larger agenda of pushing electric vehicles. Radio-talk-show host Rush Limbaugh, who aligns himself with Republicans, has frequently ridiculed the government's efforts to promote the sale of electric and extended-range electric vehicles like the Volt and [Nissan Leaf](#). Limbaugh also was among the throng charging that the [National Highway Traffic Safety Administration](#) mishandled an incident of a fire in a Volt after an accident as a way, alleging pressure from the White House, to shield the car from bad publicity.

Bashing these cars has been an applause line on the Republican campaign trail.

This is unfortunate. A shift toward diversifying the [U.S. car](#) fleet away from vehicles that rely on only gasoline to ones that draw on multiple sources of fuel, including natural gas and electricity, will decrease the country's reliance on foreign oil, as well as free consumers from the stranglehold oil companies have over the cost of driving.

Neg—Status Quo Solves**Electric Vehicles Infrastructure Being Constructed in the Status Quo**

Sacramento Business Journal, "Area agencies creating electric-car infrastructure," January 13th, 2012 (<http://www.bizjournals.com/sacramento/print-edition/2012/01/13/area-agencies-add-base-for-electric-cars.html?page=all>)

Transportation planners are building an infrastructure strategy for electric and plug-in hybrid vehicles — despite questions about how many of those cars will actually hit the road.

Some charging stations are already in place. Twenty-two stations are located at [Walgreens](#) stores parking lots throughout the Sacramento region, and a handful more are planned, said [Mariana Gerzanych](#), chief executive officer for 350Green of Los Angeles, which has a contract to install 800 stations for Walgreens in the U.S.

"It's a competitive differentiator for us," said [Menno Enters](#), director of energy and sustainability for Walgreens. "Since we are on the commute home, in many cases, that is the time that people need to top off."

Other private companies hosting chargers locally include Whole Foods in Folsom and Priority Parking, which had a charger installed at Harv's Car Wash in midtown Sacramento.

City parking garages also host chargers. Arguably the most popular public station is at 10th and I streets across from the headquarters for the [California Environmental Protection Agency](#).

Many more are planned for the area.

Neg—Status Quo Solves**Federal Funds Have Already Begun the Electric Vehicle Infrastructure**

Plug In Cars.com “Federal Funding for EV Infrastructure Spreads to Communities,” September 9th 2011

(<http://www.plugincars.com/federal-funding-ev-infrastructure-spreads-communities-107820.html>)

An early criticism of the federal government’s investment in electric car infrastructure was that it focused too narrowly on a few locations. But yesterday the US Department of Energy [announced](#) 16 projects to support EV adoption in 24 states and the District of Columbia—in an effort to encourage adoption more broadly across the United States.

The Department of Energy’s Clean Cities Initiative Awards, totaling \$8.5 million, were provided to communities ranging in experience—from those with extensive electric car charging plans in the works, to those just getting started.

With these funds, one-year projects will help communities address specific needs, such as updating permitting processes, revising codes, training municipal personnel, promoting public awareness, and developing incentives. Community-specific plans will be created and be made publicly available, allowing all stakeholders to learn best practices.

California’s South Coast Air Quality Management District was awarded \$1 million to create a unified statewide approach to planning and implementation of plug-in electric vehicle charging infrastructure.

The New York State Energy Research and Development Authority was granted \$994,500 to develop a plan for a network of electric vehicle charging stations throughout the Northeast and Mid-Atlantic regions.

In Texas, \$1 million will be spent to develop a plan for plug-in electric vehicle charging infrastructure for the Texas Triangle cities of Dallas/Fort Worth, Houston/Galveston, and Austin/San Antonio. Additional planning work is being conducted in Houston and Austin.

EV readiness and deployment strategies will also be created for Alabama, Colorado, Florida, Georgia, Hawaii, Kansas, Michigan, North Carolina, Ohio, Oregon, Pennsylvania, South Carolina and Virginia. Each of the Clean Cities approved projects will receive at least \$300,000.

These latest grants are dwarfed by the D.O.E.’s \$114.8 million of funding for The EV Project, designed to deploy and evaluate private and public charging in California, Oregon, Washington Arizona, Tennessee and Texas. Those funds were made possible by the American Recovery and Reinvestment Act (ARRA), and were matched by another \$115 million in private investment.

Neg—Status Quo Solves**USFG Investing in Electric Vehicles Now**

LA Times, "U.S. government buys its first electric vehicles," May 24th, 2011

(<http://latimesblogs.latimes.com/greenspace/2011/05/us-government-electric-vehicles-.html>)

The federal government handed over the keys to a handful of electric vehicles it purchased Tuesday. The 116 cars -- a mixture of Chevrolet Volts, Nissan Leafs and Think Cities -- are the first electric vehicles to be purchased by the U.S. government for the federal fleet. They will be distributed to 20 agencies, including the U.S. Department of Energy and Department of Defense, in five cities across the country.

The EV program launched Tuesday "is the next big step" in the government's adoption of advanced vehicle technologies, said Martha Johnson, administrator of the U.S. General Services Administration, which purchases vehicles for federal agencies. "It furthers the administration's goal of putting 1 million advanced vehicles on the road by 2015 and it represents a significant targeted investment in the next generation of automotive technology."

The 116 electric vehicles the GSA purchased will save 29,000 gallons of gas, reduce greenhouse gas emissions by 260 tons and save taxpayers more than \$109,000 every year, Johnson added. To complement the EVs, the GSA is also installing electric vehicle charging stations at federal buildings in five cities.

The U.S. government operates the largest vehicle fleet in the country. Its EV purchase represents an embrace of President Obama's directive that federal government lead the country by example, deploying smart and sustainable management practices that save taxpayer money, said Nancy Sutley, chair of the White House Council on Environmental Quality

Neg—Doesn't Solve Warming**Electric Vehicles Won't Reduce Carbon Emissions—Likely they Will Go Up**

Scientific American, "The Dirty Truth about Plug-In Hybrids," June 22nd, 2010

(<http://www.scientificamerican.com/article.cfm?id=the-dirty-truth-about-plug-in-hybrids>)

The researchers split the continental U.S. into 13 regions defined by the North American Electric Reliability Corporation and examined the mix of power sources within each region—generally, a combination of coal, natural gas and nuclear energy, with a smattering of renewable energy thrown in. They then looked at how a new fleet of electric cars would alter that supply. Nuclear and renewables, which together account for less than a quarter of the U.S. electricity supply, are "always on" sources. Their energy gets used up quickly for routine tasks, leaving little to no green energy left over to help charge a burgeoning fleet of electric vehicles. In practical terms, this means that even if you live down the street from a wind farm, its energy is already spoken for before you plug in your plug-in.

With nuclear and renewables taken out of the equation, the researchers concluded that power for the fleets will have to come primarily from coal and natural gas. If you live in a place where natural gas is dominant, electric vehicles will reduce carbon dioxide emissions—in some cases by as much as 40 percent below that of an ordinary hybrid. In regions powered mostly by coal—a much dirtier fuel—electric vehicles will lead to an increase in the amount of carbon dioxide released into the atmosphere. The zero-emission tour may have ended this spring, but the controversy over what zero really means is just getting under way.

Neg—Doesn't Solve Warming**Without Fundamental Change in the Carbon Dynamics of Electricity Generation Electric Cars Won't Do Anything**

Surprising Science, Smithsonian, "[Electric Cars Won't Save Us from Climate Change](http://blogs.smithsonianmag.com/science/2010/07/electric-cars-wont-save-us-from-climate-change/)," July 28th, 2010
(<http://blogs.smithsonianmag.com/science/2010/07/electric-cars-wont-save-us-from-climate-change/>)

[Electric cars may be part of our future](#), but anyone who thinks they're saving the world from climate change by buying one hasn't quite [thought through](#) the purchase. I'll explain:

Yes, an electric car emits no greenhouse gases. But where does the car's energy come from? The battery. And the battery's energy, for now, comes from your home.

Where does your home get its electricity? Unless you buy your energy from an all-renewable source, like a wind or [solar farm](#), your car is still emitting carbon into the atmosphere, albeit indirectly, and contributing to [anthropogenic climate change](#).

You can check where your energy comes from with the [EPA's Power Profiler](#). Just input your ZIP code, select your power company and a profile is generated comparing your fuel mix with the national average. In my neighborhood, that means I get 45.1 percent of my energy from coal, pretty close to the national average of 49.6 percent. And it's coal that's the real worry here. Coal may be cheap and abundant, but it also produces [more carbon dioxide](#) than any other carbon-based fuel source.

That's not to say that electric cars aren't part of a carbon-free future. But they're not going to get us there as long as we rely on fossil fuels, in any form, to power them.

Neg—Government Decisions Fail**Government Attempts to Pick Winners Empirically Backfire, Counterproductive to Emissions Efforts**

The Economist, "Government and the electric car," April 20th, 2012

(<http://www.economist.com/blogs/freeexchange/2012/04/innovation>)

Batteries remain very expensive to produce, and carmakers are actually quite good at squeezing ever more miles from conventional engines and hybrids when market conditions demand it. It seems quite possible, in fact, that enormous efficiency improvements in more traditional engines will keep full EVs a niche product until more [fundamental changes](#) occur in car markets. There might never be a day in which most, or even a meaningful minority, of the personal cars sitting in garages are fully electric.

Of course, things may not turn out that way. But the real possibility that they do should give us pause in thinking about how governments approach interventions in these sorts of markets.

One lesson is the tried and true aphorism that government isn't any good at picking winners. This isn't, by the way, a knock on government. No one is particularly good at picking winners. The problem for government is that while market-produced losers usually fail and go away, making room for winners, government-produced losers tend to stick around for a while, sucking resources away from potential winners. No one knows in advance whether something will work; government's failure is in its relative unwillingness to clear away the chaff.

That is the risk in something like a programme of generous tax credits for EVs. That sort of programme may develop a constituency which will rally to protect it, even after it seems clear that the credit isn't having the desired effect. And it is hard to see that it is. Some subset of consumers is clearly willing to pay a premium for EVs in order to make a statement; many of them would be willing to do so with or without a tax credit. Among marginal buyers, the most cost- and environmentally effective option might well be efficient conventional engines or hybrids—the growth of which options might be stunted by the tax advantages given to EV options. In the sort of common sense manner of thinking that we tend to see among sensible bureaucrats, EVs seem like the logical next step in automotive technology. But the logical next step is quite often not the next step, and markets excel at finding unconventional ways to tackle problems.

Neg—Federal Support Just Helps the Rich**Support for Electric Cars is Regressive—It Ultimately Just Supports the Wealthy**

Washington Post, "Overcharged," January 1st, 2012

(http://www.washingtonpost.com/opinions/overcharged/2011/12/30/glQAzQ0yUP_story.html)

Meanwhile, a lesser-known but equally dubious energy tax break also expired when the year ended Saturday: the [credit that gave electric-car owners up to \\$1,000](#) to defray the cost of installing a 220-volt charging device in their homes — or up to \$30,000 to install one in a commercial location. As a means of reducing carbon emissions, electric cars and plug-in hybrid electrics are no more cost-effective than ethanol. What's more, only upper-income consumers can afford to buy an electric vehicle (EV); so the charger subsidy is a giveaway to the well-to-do.

The same goes for the \$7,500 tax credit that the government offers purchasers of electric vehicles, a subsidy that, alas, did not expire at year's end. The Obama administration says that the credit helps build a market for EVs, which helps create jobs. Given the price of eligible models, like the \$100,000 Fisker Karma, that rationale sounds an awful lot like trickle-down economics.

Backers of the charger tax credit may lobby Congress to renew it when lawmakers tackle the payroll tax extension issue again in the new year. We hope that Congress says no. Not only is it a case study in upward income redistribution, it also would represent a deepening of the taxpayers' commitment to what looks increasingly like an industry not ready for prime time.

Neg—Can't Solve Warming (Global Emissions)**There's Nothing You Can Do About it Anyway—Emissions are Skyrocketing Worldwide—Even Significant Shifts Will Be Overwhelmed By Massive Worldwide Coal—Only Completely Reshaping the Economy Could Solve**

COLIN CAMPBELL, "WHAT IT WILL REALLY TAKE TO STOP GLOBAL WARMING," Maclean's, April 7, 2008, p. lexis

Around the world, emissions are skyrocketing. Even in countries that signed on to the Kyoto accord, they are on the uptick. Look at any graph projecting greenhouse gas emissions this century and beyond, and you will see a line going sharply upwards—a nose-thumbing at a decade of effort and tens of billions of dollars spent trying to reduce greenhouse gases. Even if every household in the U.S. screwed in an energy-efficient light bulb today, the savings in greenhouse gas emissions would be wiped out by fewer than two medium-sized coal plants—the kind of plant that is being built in China at a rate of one a week. If everyone in North America started driving hybrid cars tomorrow, it would contribute just a fraction of the overall reduction needed to cut global emissions 50 per cent by 2050—a minimum target scientists widely agree we must meet.

The problem, say a growing number of environmental economists and academics, is that, for too long, global warming has been looked at as a kind of pollution problem that can be regulated away in a relatively cheap way using existing technologies. Yet efforts to solve what is commonly described as the greatest challenge facing mankind have run aground on a sharp reality: fossil fuels are an integral part of every major economy in the world. Rich nations refuse to give them up and, more importantly, poor—and more populous—ones are relying on them to lift them from poverty. Fixing global warming requires nothing short of remapping energy infrastructures and economies all around the world. Instead, what we're doing is reducing ecological footprints with light bulbs, awareness campaigns and carbon offsets for the environmental sins of buying books and putting up Christmas lights.

Neg—Warming is Slow

Climate Change Will Be Slow, There Will Be Plenty of Time to Adapt

Robert E Simmons et al, *Percy FitzPatrick Institute of African Ornithology, University of Cape Town*, "Climate change and birds: perspectives and prospects from southern Africa," 2004 (<http://www.will.cher-alice.fr/pdf/Ostrich2004.pdf>.)

Apart from the stark threat of extinction, climate change will influence many aspects of the ecology of species as they attempt to adapt or move with the changing climate. The unanswered and difficult question is how many species in Africa are likely to face extinction as a result of the speed of habitat change. In other words, is it possible that some species will exhibit rapid adaptation to a new climate? Recent reviews of the speed of genetic and morphological change in the face of intense (typically anthropogenic) environmental change suggests that some organisms do react much faster than anticipated and show evolutionary change within a few generations (Stockwell *et al.* 2003). Some examples of rapid evolutionary change in the face of selection pressures include: (i) morphological and fat storage responses by Mosquito Fish *Gambusia affinis* to changes in their thermal environment; (ii) development, growth and reproductive timing changes by Pacific Salmon *Oncorhynchus* sp. to temperature; (iii) Pitcher Plant Mosquitos' (*Wyeomyia smithii*) photoperiod responses to global warming; among birds, (iv) Darwin's Finch *Geospiza fortis* body size and bill size changes in response to climatic changes and seed size abundance (Grant and Grant 2002, review in Stockwell *et al.* 2003). This gives conservationists some hope that the pace of **climate change will be slow** enough to enable some species to adapt to changes in temperature (cf 'Migration' below).

Neg—Will Adapt to Warming**Acclimation Eliminates the Need to Migrate—It's the Best Form of Adaptation**

Sherwood, Craig and Keith Idso, Scientists, "The Specter of Species Extinction: Will Global Warming Decimate Earth's Biosphere?" George Marshall Institute, July 29, 2003 (<http://www.marshall.org/pdf/materials/150.pdf>)

All else being equal, the global warming extinction scenario would appear to have merit. After all, if it gets "too hot" for a species of plant or animal where it currently lives, it is only logical that individuals of the heat-stressed species would have to move to a cooler location in order to survive. In many cases, however, *acclimation* can adequately substitute for *migration*, as has been demonstrated by several studies in which the temperatures at which plants grow best rose substantially (by several degrees Centigrade) in response to increases in the air temperature regimes to which they had long been accustomed (Mooney and West, 1964; Strain *et al.*, 1976; Bjorkman *et al.*, 1978; Seemann *et al.*, 1984; Veres and Williams, 1984; El-Sharkawy *et al.*, 1992; Battaglia *et al.*, 1996). So how does it happen?

One possible way in which adaptation to warmer temperatures may occur is described by Kelly *et al.* (2003). In reference to the climate-alarmist view of the Intergovernmental Panel on Climate Change or IPCC (Watson and Team, 2001), they note that "models of future ecological change assume that *in situ* populations of plants lack the capacity to adapt quickly to warming and as a consequence will be displaced by species better able to exploit the warmer conditions anticipated from 'global warming'." In contrast to this *assumption*, they report finding individual trees within a naturally occurring stand of *Betula pendula* (birch) that are genetically adapted to a range of different temperatures. As they describe it, they discovered "the existence of 'pre-adapted' individuals in standing tree populations" that "would reduce temperature-based advantages for invading species," which finding, they say, "bring[s] into question assumptions currently used in models of global climate change."

Neg—Warming is a Hoax

Warming is a Hoax—All The Predictions of Gloom and Doom Have Been Empirically Disproven

Melanie Phillips, Award Winning British Journalist, "Apocalypse deferred," The Daily Mail, April 24th, 2012
(<http://melaniephillips.com/apocalypse-deferred>)

The great grand-daddy of the man-made global warming scam, the fifth horseman of the eco-apocalypse James Lovelock, has now recanted. Well, sort of. Don't get too excited.

Lovelock now admits to having been 'alarmist' about climate change, and says other fanatics environmental commentators such as Al Gore were too alarmist as well.

You don't say.

It's only taken a quarter of a century. During that time, Professor Lovelock was the guru of man-made global warming theory. More than that, he was the prophet of a cult which turned the earth into a kind of god -- or more specifically a goddess called Gaia, investing it with anthropomorphic characteristics while his disciples demonised the human race itself as the destroyers of the planet.

Lovelock made one chilling prediction of planetary doom after another. In 2006, [he warned](#) that the earth might soon pass "into a morbid fever that may last as long as 100,000 years....as the century progresses, the temperature will rise 8 degrees centigrade in temperate regions and 5 degrees in the tropics. Much of the tropical land mass will become scrub and desert... Before this century is over billions of us will die and the few breeding pairs of people that survive will be in the Arctic where the climate remains tolerable."

Now, however, [MSNBC](#) reports Lovelock as saying:

"The problem is we don't know what the climate is doing. We thought we knew 20 years ago. That led to some alarmist books -- mine included -- because it looked clear-cut, but it hasn't happened.

"The climate is doing its usual tricks. There's nothing much really happening yet. We were supposed to be halfway toward a frying world now," he said. "The world has not warmed up very much since the millennium. Twelve years is a reasonable time... it (the temperature) has stayed almost constant, whereas it should have been rising -- carbon dioxide is rising, no question about that," he added.

Indeed, there is no question about it. Not being able to tell what the climate is actually doing, let alone what it will do in the future, is in essence what climate sceptics have been saying consistently for the past 25 years or so. And so presumably we should now count Lovelock as one of their number? Er, not exactly:

'Lovelock told msnbc.com: "It depends what you mean by a skeptic. I'm not a denier."

Good Lord, perish the thought! 'Climate change deniers' are nasty, vicious, imbecilic, rapacious neo-Nazis, aren't they? No, Lovelock's latest position is... ah, as sophisticated and, um, nuanced as we would expect from someone with such a solid and distinguished scientific track record:

'He said he still thought that climate change was happening, but that its effects would be felt farther in the future than he previously thought. "We will have global warming, but it's been deferred a bit," Lovelock said.'

Of course! Even though

"we don't know what the climate is doing"

and

"there's nothing much really happening yet"

and

"it (the temperature) has stayed almost constant, whereas it should have been rising"

--- in other words, there is no evidence whatsoever to support the theory of man-made global warming, its baleful effects have only

"been deferred a bit".

Isn't the environmental movement wonderful? Even when they admit they're totally wrong, they still insist they were right all along.

Professor Lovelock is a Fellow of the Royal Society. Some years back that august body, the embodiment of the scientific establishment and the custodians of scientific integrity, told us that on man-made global warming 'the science is settled'.

What will the Society now be saying to Professor Lovelock FRS, or he to it?

Meanwhile, although on April 4 it was [reported](#) that

'David Cameron is set to end his long silence on green issues, with a major speech in front of the world's key energy and climate figures',

and that according to climate change minister Greg Barker this would be

"a major policy intervention by the Prime Minister... a major keynote on the green economy",

it was reported [yesterday](#) that

'David Cameron is no longer making a pro-environmental oration on Thursday during a gathering of 23 energy ministers from around the world'

because according to Number 10:

'...while Cameron may have mulled a set-piece speech it was only ever considered' (hat tip: [Benny Peiser](#)).

Ah. Might the Prime Minister finally have detected that the winds of climate change are being blown somewhat off course -- and the reputations of all who promoted this, the greatest anti-scientific scam of all time, now risk being blown away with it? Too late. The planet won't fry, but the warmists are toast.

Neg—Warming is a Hoax

Warming isn't Taking Place—Best and Most Recent Peer Reviewed Science Says Your Impact Doesn't Hold Water—CO2 is Not Causing Warming

Marc Morano, Aid to Senator Inhofe, "Global Warming "Consensus" Continues To Melt Away," Congressional Documents and Publications, September 7, 2007, p. lexis

Sampling of very recent inconvenient scientific developments for proponents of catastrophic man-made global warming:

- 1) New peer-reviewed study finds global warming over last century linked to natural causes: Published in Geophysical Research Letters: Excerpt: "Tsonis et al. investigate the collective behavior of known climate cycles such as the Pacific Decadal Oscillation, the North Atlantic Oscillation, the El Nino/Southern Oscillation, and the North Pacific Oscillation. By studying the last 100 years of these cycles' patterns, they find that the systems synchronized several times. Further, in cases where the synchronous state was followed by an increase in the coupling strength among the cycles, the synchronous state was destroyed. Then a new climate state emerged, associated with global temperature changes and El Nino/Southern Oscillation variability. The authors show that this mechanism explains all global temperature tendency changes and El Nino variability in the 20th century. Authors: Anastasios A. Tsonis, Kyle Swanson, and Sergey Kravtsov: Atmospheric Sciences Group, Department of Mathematical Sciences, University of Wisconsin-Milwaukee, Milwaukee, Wisconsin, U.S.A. See August 2, 2007 Science Daily - "Synchronized Chaos: Mechanisms For Major Climate Shifts"
- 2) Belgian weather institute's (RMI) August 2007 study dismisses decisive role of CO2 in warming: Excerpt: "Brussels: CO2 is not the big bogeyman of climate change and global warming. This is the conclusion of a comprehensive scientific study done by the Royal Meteorological Institute, which will be published this summer. The study does not state that CO2 plays no role in warming the earth. "But it can never play the decisive role that is currently attributed to it", climate scientist Luc Debontridder said. "Not CO2, but water vapor is the most important greenhouse gas. It is responsible for at least 75 % of the greenhouse effect. This is a simple scientific fact, but Al Gore's movie has hyped CO2 so much that nobody seems to take note of it." said Debontridder. "Every change in weather conditions is blamed on CO2. But the warm winters of the last few years (in Belgium) are simply due to the 'North-Atlantic Oscillation'. And this has absolutely nothing to do with CO2," he added.
- 3) New peer-reviewed study on Surface Warming and the Solar Cycle: Excerpt: The study found that times of high solar activity are on average 0.2 degrees C warmer than times of low solar activity, and that there is a polar amplification of the warming. This result is the first to document a statistically significant globally coherent temperature response to the solar cycle, the authors note. Authors: Charles D. Camp and Ka Kit Tung: Department of Applied Mathematics, University of Washington, Seattle, Washington, U.S.A. Source: Geophysical Research Letters (GRL) paper 10.1029/2007GL030207, 2007
- 4) New peer-reviewed study finds clouds may greatly reduce global warming: Excerpt: This study published on August 9, 2007 in the Geophysical Research Letters finds that climate models fail test against real clouds. "To give an idea of how strong this enhanced cooling mechanism is, if it was operating on global warming, it would reduce estimates of future warming by over 75 percent," Dr. Roy Spencer said. "At least 80 percent of the Earth's natural greenhouse effect is due to water vapor and clouds, and those are largely under the control of precipitation systems. Until we understand how precipitation systems change with warming, I don't believe we can know how much of our current warming is manmade. Without that knowledge, we can't predict future climate change with any degree of certainty," Spencer added. The paper was co-authored by University of Alabama Huntsville's Dr. John R. Christy and Dr. W. Danny Braswell, and Dr. Justin Ntilo of Lawrence Livermore National Laboratory, Livermore, CA.
- 5) New peer-reviewed study finds that the solar system regulates the earth's climate - The paper, authored by Richard Mackey, is published in the Journal of Coastal Research - Excerpt: "According to the findings reviewed in this paper, the variable output of the sun, the sun's gravitational relationship between the earth (and the moon) and earth's variable orbital relationship with the sun, regulate the earth's climate. The processes by which the sun affects the earth show periodicities on many time scales; each process is stochastic and immensely complex.
- 6) A July 2007 review of 539 abstracts in peer-reviewed scientific journals from 2004 through 2007 found that climate science continues to shift toward the views of global warming skeptics. Excerpt: "There appears to be little evidence in the learned journals to justify the climate-change alarm." Update - August 29, 2007: SURVEY: LESS THAN HALF OF ALL PUBLISHED SCIENTISTS ENDORSE GLOBAL WARMING THEORY - Excerpt: "Of 539 total papers on climate change, only 38 (7%) gave an explicit endorsement of the consensus. If one considers 'implicit' endorsement (accepting the consensus without explicit statement), the figure rises to 45%. However, while only 32 papers (6%) reject the consensus outright, the largest category (48%) are neutral papers, refusing to either accept or reject the hypothesis. This is no 'consensus.'"
- 7) Chinese scientists Lin Zhen-Shan, and Sun Xian's 2007 study, published in the peer-reviewed Meteorology and Atmospheric Physics, noted that CO2's impact on warming may be "excessively exaggerated." Excerpt: "The global climate warming is not solely affected by the CO2 greenhouse effect. The best example is temperature obviously cooling however atmospheric CO2 concentration is ascending from 1940s to 1970s. Although the CO2 greenhouse effect on global climate change is unsuspecting, it could have been excessively exaggerated. It is high time to reconsider the trend of global climate change," the two scientists concluded.
- 8) Several recent scientific studies have debunked a media hyped UK study alleging there has not been a solar-climate link in the past 20 years. Excerpt: "The earth temperature does respond to the solar cycle as confirmed by numerous studies. The 11 year solar cycle is clearly shown in sediment cores obtained from Effington Inlet, Vancouver Island, B.C. by Dr. Tim Patterson, and in records of the Nile River, to name just two studies."
- 9) An August 2007 NASA temperature data error discovery has lead to 1934 -- not the previously hyped 1998 -- being declared the hottest in U.S. history since records began. Revised data now reveals four of the top ten hottest years in the U.S. were in the 1930's while only three of the hottest years occurred in the last decade. Excerpt: "NASA has yet to own up fully to its historic error in misinterpreting US surface temperatures to conform to the Global Warming hypothesis, as discovered by Stephen McIntyre at ClimateAudit.org."
- 10) Numerous U.S. temperature collection data errors exposed by team of researchers led by Meteorologist Anthony Watts in 2007 - "The (U.S.) National Climate Data Center (NCDC) is in the middle of a scandal. Their global observing network, the heart and soul of surface weather measurement, is a disaster. Urbanization has placed many sites in unsuitable locations - on hot black asphalt, next to trash burn barrels, beside heat exhaust vents, even attached to hot chimneys and above outdoor grills! The data and approach taken by many global warming alarmists is seriously flawed. If the global data were properly adjusted for urbanization and station siting, and land use change issues were addressed, what would emerge is a cyclical pattern of rises and falls with much less of any background trend," Meteorologist Joseph Conklin wrote in an August 10, 2007 blog post.
- 11) Team of Scientists Question Validity Of A 'Global Temperature' - The study was published in Journal of Non-Equilibrium Thermodynamics. Excerpt from a March 18, 2007 article in Science Daily: "Discussions on global warming often refer to 'global temperature.' Yet the concept is thermodynamically as well as mathematically an impossibility, says Bjarne Andresen, a professor at The Niels Bohr Institute, University of Copenhagen, who has analyzed this topic in collaboration with professors Christopher Essex from University of Western Ontario and Ross McKittrick from University of Guelph, Canada." The Science Daily article reads: "It is impossible to talk about a single temperature for something as complicated as the climate of Earth", Bjarne Andresen says, an expert of thermodynamics. "A temperature can be defined only for a homogeneous system. Furthermore, the climate is not governed by a single temperature. Rather, differences of temperatures drive the processes and create the storms, sea currents, thunder, etc. which make up the climate." He explains that while it is possible to treat temperature statistically locally, it is meaningless to talk about a global temperature for Earth. The Globe consists of a huge number of components which one cannot just add up and average. That would correspond to calculating the average phone number in the phone book. That is meaningless. Or talking about economics, it does make sense to compare the currency exchange rate of two countries, whereas there is no point in talking about an average 'global exchange rate.'" The article concludes: "Thus claims of disaster may be a consequence of which averaging method has been used, the researchers point out."
- 12) A July 2007 analysis of peer-reviewed literature thoroughly debunks fears of Greenland and the Arctic melting and predictions of a frightening sea level rise. In addition, the latest scientific study reveals Antarctica is not following predicted global warming models. [See July 30, 2007 - Latest Scientific Studies Refute Fears of Greenland Melt]

Neg—Negative Feedbacks

Positive Feedbacks are Not Supported By Any Science—Best New Observations Proves that Feedbacks are Net Negative—Your Models Do Not Account For Rainfall as the Most Significant Cause of Cooling

Owen McShane, chairman of the policy panel of the New Zealand Climate Science Coalition and director of the Centre for Resource Management Studies, "Climate change confirmed but global warming is cancelled", The National Business Review (New Zealand), April 4, 2008 (Lexis)

Atmospheric scientists generally agree that as carbon dioxide levels increase there is a law of "diminishing returns" - or more properly "diminishing effects" - and that ongoing increases in CO₂ concentration do not generate proportional increases in temperature. The common analogy is painting over window glass. The first layers of paint cut out lots of light but subsequent layers have diminishing impact. So, you might be asking, why the panic? Why does Al Gore talk about temperatures spiraling out of control, causing mass extinctions and catastrophic rises in sea-level, and all his other disastrous outcomes when there is no evidence to support it? The alarmists argue that increased CO₂ leads to more water vapour - the main greenhouse gas - and this provides positive feedback and hence makes the overall climate highly sensitive to small increases in the concentration of CO₂. Consequently, the IPCC argues that while carbon dioxide may well "run out of puff" the consequent evaporation of water vapour provides the positive feedback loop that will make anthropogenic global warming reach dangerous levels. This assumption that water vapour provides positive feedback lies behind the famous "tipping point," which nourishes Al Gore's dreams of destruction, and indeed all those calls for action now - "before it is too late!" But no climate models predict such a tipping point. However, while the absence of hot spots has refuted one important aspect of the IPCC models we lack a mechanism that fully explains these supposed outcomes. Hence the IPCC, and its supporters, have been able to ignore this "refutation." So by the end of last year, we were in a similar situation to the 19th century astronomers, who had figured out that the sun could not be "burning" its fuel - or it would have turned to ashes long ago - but could not explain where the energy was coming from. Then along came Einstein and $E=mc^2$. Hard to explain. Similarly, the climate sceptics have had to explain why the hotspots are not where they should be - not just challenge the theory with their observations. This is why I felt so lucky to be in the right place at the right time when I heard Roy Spencer speak at the New York conference on climate change in March. At first I thought this was just another paper setting out observations against the forecasts, further confirming Evans' earlier work. But as the argument unfolded I realised Spencer was drawing on observations and measurements from the new Aqua satellites to explain the mechanism behind this anomaly between model forecasts and observation. You may have heard that the IPCC models cannot predict clouds and rain with any accuracy. Their models assume water vapour goes up to the troposphere and hangs around to cook us all in a greenhouse future. However, there is a mechanism at work that "washes out" the water vapour and returns it to the oceans along with the extra CO₂ and thus turns the added water vapour into a NEGATIVE feedback mechanism. The newly discovered mechanism is a combination of clouds and rain (Spencer's mechanism adds to the mechanism earlier identified by Professor Richard Lindzen called the Iris effect). The IPCC models assumed water vapour formed clouds at high altitudes that lead to further warming. The Aqua satellite observations and Spencer's analysis show water vapour actually forms clouds at low altitudes that lead to cooling. Furthermore, Spencer shows the extra rain that falls from these clouds cools the underlying oceans, providing a second negative feedback to negate the CO₂ warming. Alarmists' quandary. This has struck the alarmists like a thunderbolt, especially as the lead author of the IPCC chapter on feedback has written to Spencer agreeing that he is right! There goes the alarmist neighbourhood! The climate is not highly sensitive to CO₂ warming because water vapour is a damper against the warming effect of CO₂. That is why history is full of Ice Ages - where other effects, such as increased reflection from the ice cover, do provide positive feedback - while we do not hear about Heat Ages. The Medieval Warm Period, for example, is known for being benignly warm - not dangerously hot. We live on a benign planet - except when it occasionally gets damned cold. While I have done my best to simplify these developments they remain highly technical and many people distrust their own ability to assess competing scientific claims. However, in this case the tipping point theories are based on models that do not include the effects of rain and clouds. The new Nasa Aqua satellite is the first to measure the effects of clouds and rainfall. Spencer's interpretation of the new data means all previous models and forecasts are obsolete. Would anyone trust long-term forecasts of farm production that were hopeless at forecasting rainfall? The implications of these breakthroughs in measurement and understanding are dramatic to say the least. The responses will be fun to watch.

Neg—Ice Age Links**Greenhouse Gasses are Currently at Too High Levels to Allow for an Ice Age—Warming is Single Handedly Fighting it Off**

PlanetSave, "Anthropogenic Global Warming Will Delay Natural Glaciation," January 10th, 2012

(<http://planetsave.com/2012/01/10/anthropogenic-global-warming-will-delay-natural-glaciation/>)

"We know from past records that Earth's orbital characteristics during our present interglacial period are a dead ringer for orbital characteristics in an interglacial period 780,000 years ago," said Channell.

But this time around there is more greenhouse gas in the atmosphere than there has been previously, trapping the sun's heat in and warming the planet. As a result, the normal orbital characteristics which would normally initiate a cooling phase are unable to do so. The carbon levels over the past million years as has been recorded in ice samples has never reached more than 280 parts per million.

"We are now at 390 parts per million," Channell said, a spike which has only taken place in the last 150 years.

"The problem is that now we have added to the total amount of CO₂ cycling through the system by burning fossil fuels," said Channell. "The cooling forces can't keep up."

Neg—CO2 Good (Species)**Increased CO2 Actually Avoids Species Extinctions—Even Your Studies Do Not Support an Extinction Hypothesis**

Sherwood, Craig and Keith Idso, Scientists, "The Specter of Species Extinction: Will Global Warming Decimate Earth's Biosphere?" George Marshall Institute, July 29, 2003
(<http://www.marshall.org/pdf/materials/150.pdf>)

Are significant impacts of global warming "already discernable in animal and plant populations," as Root et al. claim? Is climate change "already affecting living systems," as Parmesan and Yohe contend? The answer to both of these questions in many but not all of the cases they cite is a definite yes. Much of the biosphere has indeed responded to the global warming of the past century and a half that has transformed what we have come to call the Little Ice Age into what can now be called the Modern Warm Period. But it has not — we repeat not — brought us to the verge of biospheric disintegration, as the world's climate alarmists would have everyone believe. In fact, it has done just the opposite, aided in no small part by the concomitant rise in the air's CO2 content.

To substantiate this fact, ironically, we need look no further than to the very papers that are used by Root et al. and Parmesan and Yohe to suggest, as Root has claimed, that "we're sitting at the edge of a mass extinction." And when we do, we find that the studies they cite do not imply anything of the kind.

It is true that some species of plants and animals have indeed moved poleward and upward in response to 19th and 20th century warming; but they have not been forced to do so. The poleward and upward extensions of the cold-limited boundaries of these species' ranges have been opportunistic movements, movements that have enabled them to inhabit regions that previously were too cold for them. But where it has been predicted that species would either be compelled to move towards cooler regions or suffer death, i.e., at the heat-limited boundaries of their ranges, they have in many instances, if not most instances, succumbed to neither alternative. As a result, instead of suffering range contractions, indicative of advancement towards extinction, these species have experienced range expansions, indicative of a propensity to avoid extinction.

Neg—CO2 Good (Ag)

Increased CO2 Will Enable Increased Crop Yields and Stronger More Nutritious Plants—The Damaging Effects of CO2 They Will Claim are Impossible to Achieve

Tom Harris and Tim Ball, executive director and chair of the Natural Resources Stewardship Project, "Science ignored in heated debate over CO2 effects," The Star Phoenix, June 29th, 2007 (Lexis)

The following is the viewpoint of Ball, a Victoria-based environmental consultant who is chair of the Natural Resources Stewardship Project and former climatology professor at the University of Winnipeg, and Harris, an Ottawa-based mechanical engineer who is the executive director of the NRSP. At meetings in Europe in early June, Prime Minister Stephen Harper called "the fight against climate change perhaps the biggest threat to confront the future of humanity today" and urged "deep reductions of greenhouse gas emissions." The PM's conversion from his earlier skepticism suggests that the global warming alarmists have won the PR war in Canada's House of Commons. Harper's capitulation to political correctness is the result of a decade-long battle in Parliament in which rational voices eventually were squeezed out of the debate. Ignoring science entirely, many MPs now even refer to carbon dioxide (CO2) -- the greenhouse gas of concern in most schemes to "stop climate change" -- as "pollution." New Democratic MP Joe Comartin's assertion on Oct. 24, 2002, that: "The reality is that carbon dioxide is part of smog," stood until recently as the most memorable CO2 gaffe in parliamentary history. However, Liberal MP Sue Barnes' challenged Comartin for the honour when on Jan. 31 she accused Harper of misleading Canadians when he wrote that "Carbon dioxide ... is a naturally occurring gas essential to the life cycles of the planet." Instead of defending Harper's statement as correct, Environment Minister John Baird merely attacked the Liberals for not reducing CO2 emissions when they had the chance. Harper reinforced the notion that CO2 is pollution when he said in the same debate: "Our carbon dioxide emissions are the worst, and so are our sulphur dioxide and nitrous oxide emissions." Stephane Dion then criticized Harper for "insisting that carbon dioxide was essential to life," and concluded: "Water is also essential to life, but that information is no relief to a man who is drowning." Clearly, most MPs either have completely forgotten their grade school science or hope that most Canadians have. Carbon dioxide currently is not a major climate driver. Even if CO2 concentration doubles or triples, the effect on temperature would be minimal. The relationship between temperature and CO2 is like painting a window black to block sunlight. The first coat blocks most of the light. Second and third coats reduce very little more. Plants function best with CO2 between 1,000 and 1,200 parts per million (ppm), a level typically found in a crowded room. Greenhouses inject CO2 to reach these concentrations and so increase their yields significantly. This suggests that plants evolved to suit levels around 1,000 ppm and are CO2-starved at today's 380 ppm. At 200 ppm of CO2 plants begin to suffer and at 120 ppm they start to die. U.S. Department of Agriculture scientist Sherwood Idso calculated that the 33-per-cent rise in CO2 over the past 150 years has resulted in an increase in average world wheat yields of about 60 per cent. Higher CO2 levels enhance the health-promoting properties of food plants and decrease their water loss as the pores on leaves shrink and exhale less water, a characteristic important in drought stricken regions. It is not until CO2 levels reach 15,000 ppm that humans experience serious health impacts. That is almost 4,000 per cent higher than current concentrations and more than double the highest CO2 level seen in the past half-billion years.

Neg—SO₂ Screw

Reducing Fossil Fuel Use Will Reduce SO₂—SO₂'s Cooling Effect is Far More Significant Than the Warming Effect of Greenhouse Gasses, Meaning the Plan Causes Warming Faster Than it Could Solve It

William **Cotton**— Professor of Atmospheric Science at Colorado State University “Human Impacts on Weather And Climate, 2nd Edition, Cambridge Press” April 9, 2007 (<http://icecap.us/docs/change/aerosols.pdf>)

Clouds, we have seen, are good reflectors of solar radiation and therefore contribute significantly to the net albedo of the Earth system. We thus ask, how might aerosol particles originating through anthropogenic activity influence the radiative properties of clouds and thereby affect climate? First of all, there are indications that in urban areas aerosols make clouds 'dirty' and thereby decrease the albedo of the cloud aerosol layer and increase the absorptance of the clouds Kondrat'yev et al., 1981. This effect appears to be quite localized; being restricted to over and immediately downwind of major urban areas, particularly cities emitting large quantities of black soot particles. Kondrat'yev et al. noted that the water samples collected from the clouds they sampled were actually dark in color. A potentially more important impact of aerosol on clouds and climate is that they can serve as a source of cloud condensation nuclei CCN and thereby alter the concentration of cloud droplets. Twomey 1974 first pointed out that increasing pollution results in greater CCN concentrations and greater numbers of cloud droplets, which, in turn, increase the reflectance of clouds. Subsequently, Twomey 1977 showed that this effect was most influential for optically thin clouds; clouds having shallow depths or little column integrated liquid water content. Optically thicker clouds, he argued, are already very bright, and are therefore susceptible to increased absorption by the presence of dirty aerosol. In Twomey's words: "it an increase in global pollution could, at the same time, make thin clouds brighter and thick clouds darker, the crossover in behavior occurring at a cloud thickness which depends on the ratio of absorption to the cube root of drop nucleus concentration. The sign of the net global effect, warming or cooling, therefore involves both the distribution of cloud thickness and the relative magnitude of the rate of increase of cloud-nucleating particles vis-a-vis particulate absorption." Subsequently, Twomey et al. 1984 presented observational and theoretical evidence indicating that the absorption effect of aerosols is small and the enhanced albedo effect plays a dominant role on global climate. They argued that the enhanced cloud albedo has a magnitude comparable to that of greenhouse warming see Chapter 11 and acts to cool the atmosphere. Kaufman et al. 1991 concluded that although coal and oil emit 120 times as many CO₂ molecules as SO₂ molecules, each SO₂ molecule is 50-1100 times as effective in cooling the atmosphere than each CO₂ molecule is in warming it. This is by virtue of the SO₂ molecules' contribution to CCN production and enhanced cloud albedo. Twomey suggests that if the CCN concentration in the cleaner parts of the atmosphere, such as the oceanic regions, were raised to continental atmospheric values, about 10% more energy would be reflected to space by relatively thin cloud layers. He also points out that an increase in cloud reflectivity by 10% is of greater consequence than a similar increase in global cloudiness. This is because while an increase in cloudiness reduces the incoming solar radiation, it also reduces the outgoing infrared radiation. Thus both cooling and heating effects occur when global cloudiness increases. In contrast, an increase in cloud reflectance due to enhanced CCN concentration does not appreciably affect infrared radiation but does reflect more incoming solar radiation which results in a net cooling effect.

Neg—Private CP Solvency**EV Infrastructure is Big Business Now—Investment Opportunities Abound**

Co.Exist Magazine, "The Next Big Business Opportunity: Electric Vehicle Charging Infrastructure," March 31st, 2011
(<http://www.fastcoexist.com/1677857/the-next-big-business-opportunity-electric-vehicle-charging-infrastructure>)

Looking for a way to angle into the burgeoning electric vehicle business? Forget cars--investing in the charging infrastructure is the way to go. A new report from [GTM Research](#) claims that global EV sales will grow fivefold to 3.8 million by 2016 (there were 246 million total cars on the road just in the U.S. as of 2009). All those cars will need convenient places to charge up.

There are, of course, plenty of major companies already working hard to build charging stations. Our [slideshow](#) from last year showed off some of the more promising charge station prototypes in the pipeline, including GE's WattStation charger (pictured above), ECoTality's Blink Charger, and the Coulomb Chargepoint charger. All of these chargers have begun rolling out or will be released later this year. Coulomb will have 2,600 public stations in the U.S. by October 2011, and ECoTality plans to deploy almost 15,000 charging stations in 16 U.S. cities in the near future. But that's not even close to enough for 3.8 million cars.

There are ways to get in on the EV infrastructure boom without building chargers. Instead, entrepreneurs might want to focus on the smart grid side of things. After all, the grid needs to be able to handle the rapid growth in EVs--and right now it can't. That means utilities need to invest in all sorts of smart devices for the grid, including upgraded voltage regulators, capacitor banks (groups of high-voltage capacitors that control the level of voltage supplied and absorb energy from power line spikes), and communication networks.

Again, there are companies--such as [Trilliant](#) and [Silver Spring](#)--working on these problems. But as the number of EVs climbs to ten or even hundreds of millions in the coming decades, the charging infrastructure business will explode. Don't say we didn't warn you.

Neg—States Solve**State and Local Programs are Supporting Infrastructure Now**

Sacramento Business Journal, "Area agencies creating electric-car infrastructure," January 13th, 2012 (<http://www.bizjournals.com/sacramento/print-edition/2012/01/13/area-agencies-add-base-for-electric-cars.html?page=all>)

SMUD, Valley Vision and the Sacramento Metropolitan Air Quality Management District are partners in that effort. Two years ago, SMUD secured a \$500,000 grant, a combination of U.S. Department of Energy and [California Energy Commission](#) funding, to develop regional codes and standards for the charging infrastructure needed to support and expand the market for electric vehicles.

The goal is to get local governments to adopt similar processes for charging station installations "so that installation contractors and drivers all have a common language and common expectations," Boyce said.

SMUD plans to give that funding to SACOG, the region's transportation planning agency, in a couple of months. "We're not transportation planners," Boyce said. "Instead of trying to reinvent the wheel, we thought it would be better to go get expertise in that area."

While SMUD has more than 20 years of experience in electric transportation, the utility is focused on ensuring that what ever gets planned does not negatively impact the electrical grid.

Neg—States Solve**Solving Warming is Possible Only With Substantial Investment in Electric Vehicle Infrastructure By State Governments**

[James Corless](#), Campaign Director, Transportation for America, "Smart Technology Means More Options," National Journal, June 24th, 2010 (<http://transportation.nationaljournal.com/2010/06/what-should-transportation-dep.php>)

Developing a smarter and cleaner transportation system that reduces greenhouse gas emissions and our dependence on oil must be the overriding vision that guides the next federal transportation bill. Part of that vision must be realized through smarter approaches to managing traffic congestion, providing more options like public transportation, vanpools, intercity buses and high speed rail and offering incentives for states and local governments to develop more walkable and livable communities that encourage shorter commutes. But if we're serious about reducing emissions and oil dependency, that vision can only be fully realized if we make a significant investment in infrastructure that will accelerate a transition to electric vehicles.

Just as the state Departments of Transportation play a crucial role developing smarter approaches to managing traffic and creating more travel options, they have a role to play overseeing the complex infrastructure needed to operate these vehicles. Giving DOTs a role in electric vehicles does not mean playing favorites or micromanaging research. The most promising technologies of tomorrow will continue to come from the private sector, as well they should. IBM has shown how intelligent transportation systems (ITS) make the movement of goods and people more efficient and economical, and this includes technologies that benefit private vehicles as well as public transit. But as John Horsley rightly points out, DOTs have an important role to play in harnessing this innovation, specifically by creating a smart grid and recharging infrastructure.

Neg—States Solve

State Grant Money Already Exists—States Will Be Able to Create the Necessary Standards Now

Sustainable City Network, "Get in Pole Position for Federal Electric Vehicle Infrastructure Investments; Grants Available," May 4th, 2011 (http://www.sustainablecitynetwork.com/blogs/legislative/article_0478e1cc-769f-11e0-833c-0019bb30f31a.html)

Many local governments and regions have already begun to think about America's transition to alternative fuel vehicles. Cities like Raleigh, North Carolina, Indianapolis, Indiana, and Portland, Oregon, have already taken the electric vehicle plunge. Working with the Rocky Mountain Institute's [Project Get Ready](#) initiative, these cities and others have partnered with industry, non-profits and citizens to plan for the wide-scale deployment of electric vehicles in their communities. That planning involves identifying ideal charging station locations, updating local building codes, developing fast track permitting, determining charging pricing schemes, and more. Preliminary planning is critical as electric vehicles become more commercially available, and especially as federal funding will flow first to communities ready to roll out electric vehicle infrastructure.

In support of this goal and in advance of potential FY 2012 funding, DOE is awarding \$5 million in grants for communities to plan and implement policies for the development of local/regional electric charging infrastructure, including implementation of local policies, procedures, and incentives that facilitate that development. These planning and policy activities will prepare communities for successful deployment and implementation of plug-in electric drive vehicles in anticipation of larger electric vehicle deployment efforts in the future. DOE anticipates making approximately 10-15 awards, ranging from \$250,000 to \$500,000. Grant applications are due to DOE by June 13, 2011. For a copy of the funding announcement, [click here](#).

Neg—States Solve**States Have a Number of Options For Incentivizing Electric Cars Now—They are Best to Make Changes in Demand**

School of Public and Environmental Affairs at Indiana University, "Plug-in Electric Vehicles: A Practical Plan for Progress," February 2011 (http://www.indiana.edu/~spea/pubs/TEP_combined.pdf)

Another popular option for states is policy that encourages manufacturing of PEVs or their batteries in the state. Implemented by Indiana, Michigan, Louisiana, New Mexico, Oklahoma, South Carolina, and Pennsylvania, these policies include property tax exemptions, tax credits for purchasing manufacturing equipment, and tax credits based on kilowatt hours of battery capacity produced. Several of these credits are not specifically targeted to promote PEVs, but apply to the manufacture of all alternative fuel vehicles. Other states, mainly in the Midwest and Plains states, have alternative fuel credits, but exclude electricity from their definition of "alternative fuels." A related option is to provide incentives or grants for R&D to improve PEV technology, such as those now in place in Michigan, Vermont, California, and Wisconsin. Several states have chosen to subsidize recharging infrastructure for PEVs, both at home and on the go. Arizona provides a \$75 tax credit for the installation of home recharging outlets. Colorado provides recharging infrastructure grants to local governments based on the municipality's energy efficiency record, and Virginia has a similar program. Louisiana offers a tax credit for 50% of the cost of constructing an alternative fueling station. Washington, in particular, has developed a suite of infrastructure policies that strongly encourage PEV use. Washington sales and use taxes do not apply to labor and services for installing, repairing, altering, or improving PEV infrastructure (the same exemption applies to batteries) or to the sale of property to be used for PEV infrastructure. All regional transportation planning organizations that encompass a county with a population of 1 million or more must collaborate with state and local governments to invest in PEV infrastructure and promote PEV use generally. Additionally, the state must provide PEV recharging infrastructure at all state rest stops and fleet parking and maintenance facilities by 2015. Local governments are required to develop regulations that allow the installation of PEV infrastructure, contingent on federal funding. Washington allows leasing of state land for Better Place-style battery-switching stations for 50 years and exempts these stations from certain environmental regulations. States have also adopted policies to ease or reduce the auxiliary costs and inconveniences of driving a car powered by electricity. Arizona has reduced the license fee for BEVs and some PHEVs. Florida provides PEV owners with exemptions from most insurance surcharges. Washington exempts PEVs from emissions inspection requirements. An especially common practice is to allow single-rider PEVs to occupy HOV lanes—Virginia, Maryland, and California are among the states to adopt this policy. Delaware has a unique approach to offsetting costs of a PEV: it has passed a law requiring that PEV owners be credited for electricity provided to the grid by the car battery at the same rate that the owner is charged for electricity use. Finally, states have opted to provide grants and loans to local governments for various activities that will promote use of PEVs. These activities include electrifying school buses, purchasing PEVs for municipal fleets, and installing recharging infrastructure.

Neg—States Solve**States are Crucial to Creating Viable Infrastructure for Electric Cars**

[John Horsley](#), Executive Director, American Association of State Highway and Transportation Officials, “Electric Cars and the Role of State DOTs,” National Journal, June 21st, 2012

(<http://transportation.nationaljournal.com/2010/06/what-should-transportation-dep.php>)

So what is the role that can be played by state departments of transportation in bolstering the fledgling - but growing - electric car and alternative-vehicle market?

1) Several state departments of transportation are already taking steps towards increased electric vehicle deployment by providing needed infrastructure for refueling and other support services. Washington, Oregon, California, and British Columbia are working together on an initiative for the Interstate 5 West Coast Green Highway. The partnership, which involves both public agencies and the private sector, is working to build a framework for electric vehicles and other alternative fuel vehicles along the entire 1,350 miles of the I-5 corridor. Currently in the early stages of the initiative, the Washington, Oregon, and California Departments of Transportation are working to develop electric vehicle infrastructure standards, guidelines, and consistency in signage.

2) By turning over their own vehicle fleets to include electric cars, buses and other alternative energy products, state DOTs can also affect change. In 2000 the former Governor of New York State, George Pataki, announced a plan to transform the NYC Transit bus fleet into the cleanest in the world. The first few years of the program focused on cleaning up the diesel fleet, but recent improvements have included adding both compressed natural gas and hybrid-electric buses. Just last week, on June 16, 2010, Virginia's Governor Bob McDonnell announced a initiative to increase the use of electric vehicles in the state. Called Virginia "Get Ready" the plan will involve a number of state and local government agencies and businesses, vehicle manufacturers and agency fleets, universities, utilities, and the Virginia Department of Transportation.